The Publication for LightWave 3D, Aura, Flyer and Amiga Users

NewTekNIQUES

YOUR NEWTEK INFORMATION GATEWAY IN PRINT AND ON-LINE

August/September 1999
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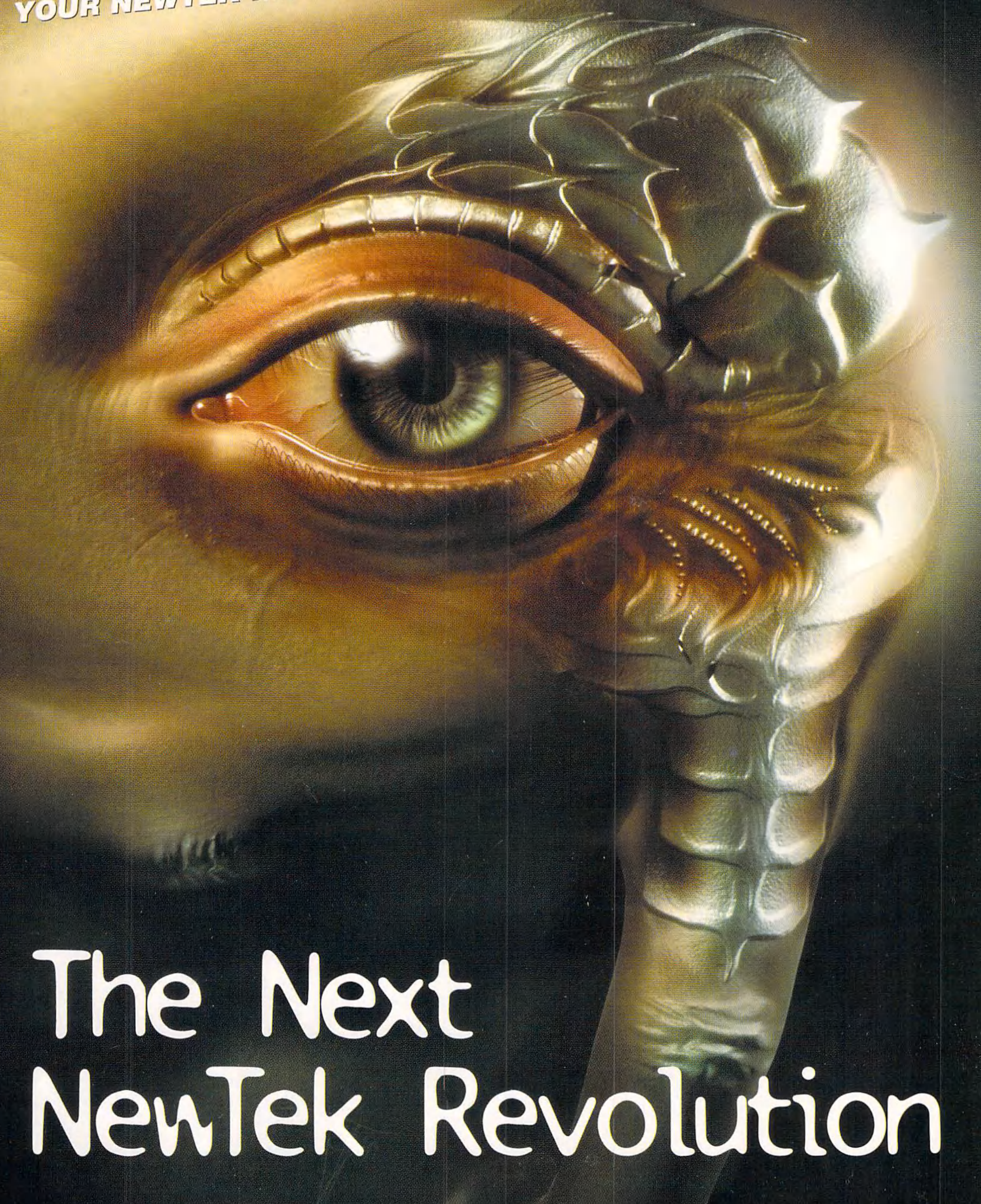
LIGHTWAVE 3D:
The Joy of Six
"Software that is like buying art"

Tim Jenison Talks Toaster NT
"I want to take over the world of video"

MILLENNIUM IS COMING...
The long awaited Amiga Toaster/Flyer upgrade

TUTORIAL:
Realistic Fur!



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Web site: www.digmedia.co.uk
E-mail: shenderson@advanstar.com
Advanstar Communications (U.K.) Ltd
Advanstar House, Park West, Sealand Road, Chester CH1 4RN U.K.
Telephone Jason Moss on +44 (0)208 987 0900
Fax +44 (0)1244 399 180

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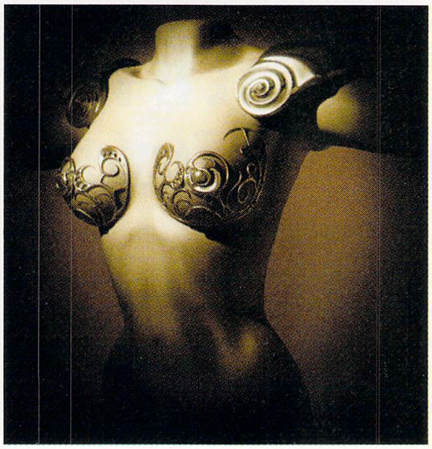

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From the Ground Up

by Dick De Jong and Molly Dinkins

Get behind the scenes of LightWave 3D development, and meet the people that are building the sixth floor onto this towering 3D factory.

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ON THE COVER:

This issue's cover, "I spy with my little eye", was created by Taron as a brief period of escape from working on the *Dungeons and Dragons* feature movie project being done at Station X Studios. The image was modelled and rendered using LightWave 3D, with final texturing and filtering done in Photoshop. You can enjoy more of Taron's work on the NewTekniques website.

TekTALK

OPINIONS ON IMPORTANT NEWTEK ISSUES FROM THE ASSOCIATE PUBLISHER

BY **JOE TRACY**

I'd like to raise my glass to *toast*, "To NewTek..."

THANK YOU, NEWTEK

NewTek Delivers Video Toaster NT

Soon, hundreds of video producers will be playing with a new toy: NewTek's Video Toaster NT. This system is destined to turn a lot of heads; particularly when the complete product (storyboard interface, etc.) ships later this year.

Decisions, Decisions

Having moved into new horizons (read last issue's TekTALK), I find myself faced with making decisions a little differently from when I was working as editor of NewTekniques. In my new position, at American Computer Experience (ACE), I often have to decide which products I should buy to accomplish certain tasks. I have a budget and have to make a determination as to which product is right for a particular job. Specifically, one of my job duties is to create video content that can be used on the Web, on CD-ROMs, on television, and in videos. That means I am in a position to choose between products from Avid, Play, NewTek, Fast, and a dozen other companies. So what choice will I make?

You may think that this decision for me is easy. Well, I have news for you... you're right!

Why NewTek?

NewTek is by no means a perfect company, and I've been very open with readers (and even NewTek) about particular areas that need a lot of work. Even though there is room for improvement, there's no doubting that NewTek produces tools that are innovative, easy to use, and give everyone a chance to do what "the big guys" do, for a lot less money. If the Video Toaster NT is even 3/4 as great as the Video Toaster and Video Toaster Flyer have been for me, then I'll be very happy.

About Tim Jenison

In my opinion, Tim Jenison has never lost sight of his vision with NewTek. Jenison, like many of us, started off as a very frustrated video producer, and has dedicated his life to making the video producer's job much easier, and to giving them much more powerful and affordable tools. He selected a very talented team to bring those visions to life, which resulted in LightWave 3D becoming the #1 used 3D program in Hollywood. Most CEO's would demand drastic price increases for products like LightWave 3D, but through thick and thin NewTek has consistently kept its products priced to everyone's benefit.

Continuing the Vision

As we approach the year 2000, I'd like to encourage NewTek to continue its vision of pushing the envelope of technology in the areas of animation, video, and digital painting. It's not often that we take the time to reflect and say "thank you" for the innovative products a particular company delivers. So with the Video Toaster NT soon to be in users hands, and LightWave 3D 6.0 just around the corner, I'd like to raise my glass to *toast*, "To NewTek... For the many great years past, and the many more still to come!"

Cheers,

Joe Tracy

NEWTEKNIQUES

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EDITOR-IN-CHIEF	DHOMAS TRENN DHOMAS@YOUNGMONKEY.CA
ASSOCIATE PUBLISHER	JOE TRACY JTRACY@ADVANSTAR.COM
FEATURE EDITORS	DICK DE JONG MOLLY DINKINS
LEAD TUTORIAL WRITER	DAVE JERRARD
COLUMNISTS	BOB HOOD, BOHUŠ BLAHUT, GREG NELSON, MOJO, SCOTT WHEELER
ONLINE	BOB KETCHUM, CECILIA, DAVE HAYNIE, JARED BROOKES, KERMIT WOODALL, KEVIN HANLEY
ART DIRECTOR	HEIDI SANDISON
ADVERTISING	(714) 513-8405
AD REP	MARIA KRISTINA ADAMEK
PROMOTIONS	YVONNE STIFTER
PRODUCTION MANAGER	MARIA KRISTINA ADAMEK

HOW TO REACH US:

NewTekniques, 201 E. Sandpointe Avenue,
Suite 600, Santa Ana, CA 92707, USA
Tel.: (714) 513-8400, Fax: (714) 513-8612

MARKETING SERVICES
REPRINTS Mary Clark (800) 822-6678 • FAX (541) 686-5731

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GROUP VICE PRESIDENT	Danny Phillips
DIRECTOR OF OPERATIONS	Michael T. Weldon
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FirstWORDS

A FEW WORDS FROM OUR EDITOR

by dhomas trenn

REVOLUTION MEETS EVOLUTION

There's a tremendous amount of change in the industry lately, and it's hard not to get caught up in the excitement of all that is going on.

The NewTek Revolution

As you know, several revolutionary new products and upgrades are on the verge of appearing out of NewTek. First out of the gate, will be the Video Toaster NT which will give us more powerful video editing at a more affordable price. Next to follow will be LightWave 3D 6.0, having been reprogrammed from the ground up, to make it faster and even more powerful. Not last or least to come, is an upgrade for the Amiga Video Toaster and Flyer called Millennium. These products are sure to revolutionize the way we work, and expand our creativity. See our feature articles this issue to find out more.

The Amiga Revolution

There's also a great deal of excitement in the Amiga community, and a lot of speculation about what is going to happen. The Amiga NG, now known as the Amiga Multimedia Convergence Computer (MCC), is still expected to be released this year. Recent conflicting announcements have brought about a flood of response, both for and against, from the Amiga community. Turn to The Gateway News to see what's been happening.

The NewTekniques Evolution

I guess it's understood that along with a new editor, comes new ideas and changes. I've been really busy working on a lot of new plans for NewTekniques, both online and in print. We've got several exciting new projects in the works, and new ideas that you will start seeing pop-up in this and upcoming issues.

NewTekniques Online continues to grow, and now you can see what's online by turning to the NewTekniques Online Contents page, here in print. We also have a new symbol to let you know when an article contains related online content.

LightWave tutorial coverage is improving in several ways: (1) We began the LightWave Fundamentals column in last issue's online section, to introduce concepts at a beginner level. (2) Tutorialists are now following guidelines to help with consistency in all tutorials. (3) When possible, tutorials will be doable with some earlier releases, with additional steps added for newer versions. (4) For those of you using early versions, we now have some tips to help you find your way around the changes in the software.

Revolution Meets Evolution

While NewTek and Amiga begin their next revolutions, NewTekniques continues along it's path of evolution - with lots of surprises to come. With all these great new multi-media products in the not too distant future, your needs are sure to be changing, and you can rest assured that we'll continue to be right there at your side.

Last Words...

Wonderful things are happening.

dhomas trenn

dhomas trenn, evolutionist

ONLINE CONTENT

This article has additional
Online Content
www.newtekniques.com/bonus

When you see this symbol, it means that additional content related to that article is available in the NewTekniques Online bonus area. You'll most often see this with tutorials, when it means that support files are available for download, or that a variation of the technique is discussed in an online tutorial. For other articles, it might mean that demos, programs, or other related files are available online.

TUTORIALS

General

Keyboard shortcuts, and the keystrokes required to complete them, are enclosed in square brackets. [b] or [B], for example, refers to the lowercase letter, while the uppercase alternative would appear as [shift-b].

Gadgets are referenced similarly, either bracketing the gadget itself or indicating the value the gadget should be set to.

LightWave 3D

Generally, LightWave 3D tutorial functions are referred to as seen in v5.6. Here are some tips, for using earlier versions:

- Some functions have moved, for example, Render panel options may be in the Record panel, Camera panel functions in the Render panel.

- If measurements are not accepted as described, try converting values to meters. For example 1 cm = .01 m.

- Before v5.0, texture layering was not possible. Try using just the first texture described.

- If you still can not produce an expected result, consult your manual for more details on a function, or email the authors, can likely help you get through with the version you are using.

WAVE F/X

LIGHTWAVE SUCCESS IN THE COMPETITIVE TV & FILM F/X MARKET

What happens when you pop the cork of a champagne bottle...in space?

ZERO-G CHAMPAGNE

Taking LightWave 3D into Space

BY
GREG NELSON

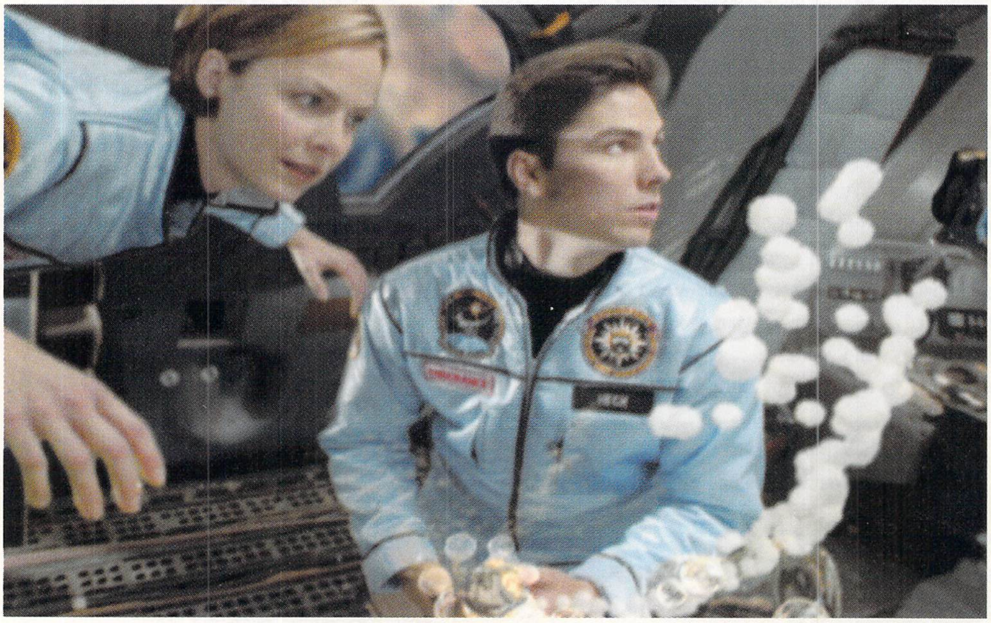
More often than not, I find myself cursing the proverbial "they". If only "they'd" shot it like this, or if only "they'd" thought of that. It usually ends with "Man, I wish I'd been on that set."

Every once in a while things just seem to work out. For the past month, I've been working on a series of shots for a Korbel Champagne commercial. This time, it actually happened - I got to be "they". For the first time in my career, I was involved in a sequence of shots from script to screen. I finally got to gather all the information I needed to make the shot work: measure the lighting, measure the set, place tracking marks, and get all the necessary camera information. You know, the little details that make all the difference in the virtual world.

VIRTUAL WALLS

The most difficult shot required me to model, light and attach the rear crew cabin from the interior of a space shuttle to a practical interior cockpit.

Normally, a CG wall replacement shouldn't be too difficult to create. However, as with many shots, this one was a little tricky. First, it was shot using a Steadicam stabilization system and a 12 mm lens. Second, the camera was moving all over the place, on all axes; so, tracking was a major issue.



I had to wait for the film to be processed, so I spent that time tweaking the lighting in the LightWave 3D scene, based on the diagrams I had drawn of the lighting on set. Since this had been done in advance, I was easily able to match the actors and practical set perfectly. Once the film was in my hands, I spent the major portion of a week doing the tracking. I usually track in two phases, first in LightWave to get the Heading, Pitch, and Z. Then again in Digital Fusion to get my X, Y, and Bank settings.

Despite the fact that I got to put tracking marks on the wall, mea-

sure the set, and measure the camera's beginning and ending positions, tracking this shot was still quite a challenge. Because camera stabilization systems are such a free-form way of filming, I never knew exactly where the camera was.

After watching the footage several times, I got a sense for how the camera was moving. Using that information, and the beginning and end marks I had noted, I started filling in the middle of my camera motion. Since I needed to match the edge of my practical wall with the edge of my virtual wall, the tracking just had to line the two walls up over time. I knew if I could keep the seam of my walls from floating around too much, as my LightWave camera rotated, I could finish the track in Fusion. After a few tries, I had a very accurate tracking for the Z, Heading, and Pitch movements.

After I had rendered those movements, I took the result into Fusion and started on getting my X and Y tracking set. After a few tries, the seam of my wall was holding tight.

There was however, an issue of lens distortion. One area that is lacking in LightWave, and most other 3D programs, is the ability to match lens distortion on wide angle lenses. Since the folks at Panavision were working with glass lenses that distort differently from lens to lens, there was no way LightWave's lens would ever distort the exact same way.

The reason this issue is important, is that it makes the tracking look like it's not working, even when it really is. I ran into a problem with the escape hatch on the side wall of the shuttle. No matter how well the wall tracked in, the escape hatch was not distorting correctly, and ended up looking like it was floating behind the practical wall. I know it's hard to understand without seeing it; but trust me, it looked weird.

To resolve this, I rendered the escape hatch as a separate element and composited it back on top in Fusion. Next, using Fusion's Corner Positioner tool, I distorted the escape hatch to keep the edges of the wall and hatch lined up next to each other. If you look at the picture, you can see how the two edges needed to be lined up. Was my solution mathematically correct? I doubt it. Does my eye know that? No. But, most importantly, the client loved it.

At one point, there was a thought of not using CG at all, and just renting the entire shuttle cockpit. But, the rental cost of the front and rear sections was about $15,000 per week. It doesn't take an accountant to figure out that a good modeler costs significantly less than that per week. So there we were, snapping pictures from every angle and pulling out the measuring tape every chance we got. In a few days, I had the shuttle interior modeled, textured and lit, looking just like it did in the pictures, but at much less cost.

POPPING THE CORK

The other big effect, was to have champagne exploding out of a bottle held by one of the actors. If you can get beyond the "there's no way, a bottle of champagne would explode in outer space" factor, this is kind of a cool idea.

Essentially, this whole effect was done as a HyperVoxels and Particle Storm trick. The first thing we did was to track a null to the top of the bottle. Then we parented all the Particle Storm emitters to that null.

We had studied several slow-motion shots of champagne bottles popping, and we were able to break the elements down into foam, spray, mist, globs and the actual champagne itself.

The toughest part of this was the surfacing of the HyperVoxels. We were told that the liquid element of the champagne should look very much like the water creature in the movie *The Abyss*.

To achieve this effect, I chose a two-pass approach. The first pass involved rendering the Digital Fusion flow I had used to attach the rear shuttle wall to the front. Once, that was rendered, I took the resulting frames and used them as a reflection sequence for the HyperVoxels elements.

By using this reflection sequence mapped on to the champagne glob elements, and making those globs highly reflective, the globs that come streaming out of the bottle look almost like liquid metal.

Admittedly, HyperVoxels can be difficult to control, especially when the director says, "I want a glob here and here". A situation like that can be a hit and miss process; where you have to go back to Particle Storm, adjust the emitters and render the HyperVoxels to see if it works. Usually, it doesn't. So, I created a couple of polygon globs with morph targets and the same surface properties as the HyperVoxels, and then added a ripple displacement map. In about ten minutes, I had champagne globs exactly where they needed to be.

Then, when I put that element back on top of the footage in Fusion, I played with the transparency and color, as well as added a couple of slight highlight filters. With all three of these processes added to the glob elements, it really made it look like zero-G champagne.

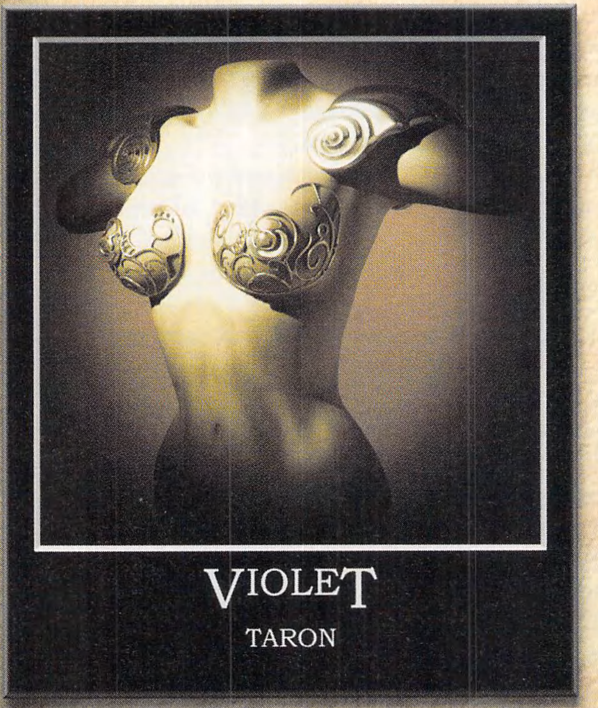
One of the elements in this shot that everyone thought made the whole thing look realistic, was the addition of some highly blurred particle streams attached to the bottle. As soon as the cork blew, these streams began spraying all over the place. They are very subtle, but they really blur the line between virtual and reality.

Currently, the commercial is scheduled to run nationally in October as part of Korbel's "Millennium" celebration.

Greg Nelson is a senior animator at Threshold Digital Research Labs.
You can email him at Kidneyboy@msn.com

From the Ground Up

LightWave 3D 6.0



WRITTEN BY: DICK DE JONG AND MOLLY DINKINS

GALLERY DESIGN BY: DAVE JERRARD

LAYOUT BY: HEIDI SANDISON

CONCEPT BY: DHOMAS TRENN

Faced with the task of adding another floor on to the 3D factory they have been constructing for over ten years, Stuart Ferguson and Allen Hastings, LightWave 3D's architects and master builders, realized they needed to do some major foundation work. If each new version of the software were a new story on the structure, Ferguson knew almost three years ago that it was time to redesign the underlying architecture before the sixth floor could be added.

The rebuilding task for LightWave 6.0 has been daunting. "The code changes in Layout have been five times bigger than in any other upgrade," Ferguson said. The process was similar to the cross-platform gymnastics they performed in porting 4.0 from the Amiga to the PC. "It required taking the existing system and creating a whole new architecture," Ferguson described.

"It had to be done," Hastings said. Ferguson added, "But to do it right, you need to go back to where you started. Then you re-implement the old features in a new way, to create a robust system."

"This release is more serious than any other," said Brad Peebler, NewTek's Vice President of Marketing and the manager of LightWave development. "We've had 15 to 20 developers working on Purple (NewTek's internal code name for 6.0) for two years. At first, it was just Stewart doing the architecture. After LightWave 5.6 was shipped, everyone was working on it."

"The architecture has changed radically," Peebler continued. "Now we can completely separate out the cross-platform issues into separate code. The developer doesn't need to worry about it."

"With the new architecture, we can add features (Peebler snapped his fingers) just like that - faster than ever before. We have more people working on plug-ins that will be integrated into the program."

The dynamic nature of 6.0's development was evident when we visited the LightWave team's San Francisco offices. Even as they were preparing for a full product roll-out at the upcoming SIGGRAPH convention, new features were being added. "We're now in a heavy integration phase," Peebler explained.

As this article went to press, 6.0 was not available for review; but Peebler touted some of its hottest features. The new rendering engine has integrated volumetrics with HyperVoxels technology, and includes caustics and radiosity. "It will be equivalent to mental ray, but it should be faster," Peebler said. "Allen Hastings is one of the best rendering programmers in the world. His new approach will work faster. It still takes a lot of time, but it will be faster than Lightscape. With LightWave you can dial the quality up and down."

Modeler 6.0 has a completely interactive tool set, to go along with its new paradigm of operation. Included in the expanded bag of tricks are new character modeling and animation features with tantalizing titles - Intellegentities™ with Endomorphs™, Skelegons™, and MultiMeshes™. Also, UV mapping controls with infinite layering have been added. "There has been a large outcry for UV mapping. For gaming it is essential," Peebler said. "Most people who asked for it, won't use it - it's too complicated. It won't be what you use in 90 percent of your animations."

The demands of the gaming community have been a particular concern for NewTek. "We have 51 percent of the film and video market, but only 10 percent of the gaming market," Peebler said. "For gaming, the tactical integration is much more important. We have to expose a lot of detail to them to control our system. We're working very closely with Sony on PlayStation 2. We hope we can import LightWave data directly into PlayStation 2."

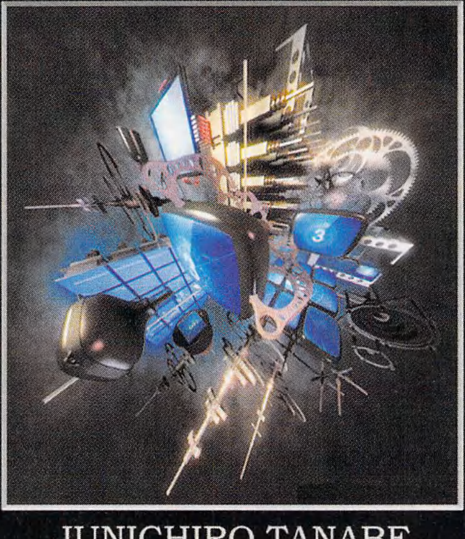
"Our target markets differ less and less every day," Peebler added. "6.0 has eliminated the obstacles for gamers. We can wave the flag and say, 'Come and get it.'"

The development team stays in constant contact with their key accounts. Their most direct method is to have LightWave engineers sitting down with animators. Hastings has traditionally been the point man in visiting animation houses. "Studios like Will Vinton are very demanding; but that is good," Hastings said. "I added the 3D camera in Layout for their 3D M&Ms project."

During the production of the visual effects for Titanic, Hastings would call on Digital Domain. Sometimes when the animators asked for a feature, "I would work on it over lunch on my notebook computer and hand them a floppy disk and say, 'Here you go.'" Hastings said. Usually a similar request to a larger 3D software company would have to go up the chain of command.

The LightWave team tries to temper their response to requests with an eye to practicality. "When we develop, we listen to people's suggestions," Peebler explained. "For example, people said 'We want a nurbs modeler.' We asked, 'Why?' They said they wanted to model things organically. So we gave them an organic modeling function."

Occasionally, the response can go overboard. "LightWave 5.6 has the most flexible kinematics in the universe, but the inverse kinematics [a technique of controlling the motion of a human body - essential for character animation] was tremendously difficult to setup," Peebler said. "In 6.0, we have modes that dumb down the operation. Essentially, it's a better animation system. We also have an integrated soft bodies engine that will automate secondary functions, like hair and cloth. Generating secondary



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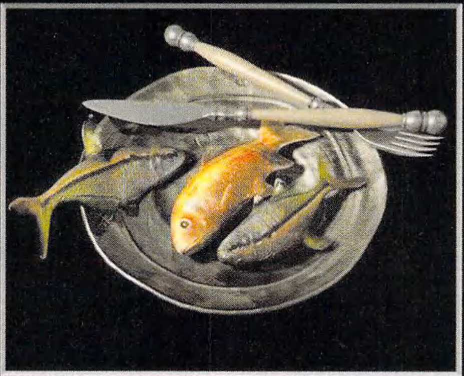

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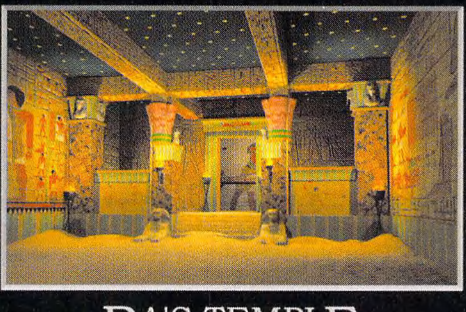


RA'S TEMPLE

TONY DE LUCA
DIGITAL CANVAS

WILLARD
CHARLES MAYER
WET CEMENT PRODUCTIONS

IMAGINATION
IN MOTION

ANGEL VISION
JENNIFER LYNN
HACHIGIAN

and animating primary is the way to go. Character simulation is not addressed in this version."

Talking about the tendency to keep adding new tools to the software, Peebler admitted, "I'm handling feature creep with sheer panic. We have a target date for code freeze. Occasionally, our developers will have midnight inspirations. They will come to me and say 'I can do this and this.' And I think, 'Ooh, that would be cool. Let's do it.' We don't want to restrain that, but we also don't want it to affect our shipping schedules."

The programmers have also been exchanging design ideas about the look of the user interface - down to the color and shading of buttons. "When we went from 5.0 to 5.5, we changed the look and people thought it was a gigantic upgrade," Peebler said. "6.0 will have a new look, but we are adamant about not breaking the workflow. Also, the interface will be customizable." If someone is accustomed to another program, they can alter LightWave's interface to replicate that look.

"We want to show three advantages with LightWave," Peebler summarized. "First, we want to be the price/performance leader - we have all the features on the checklist. Secondly, we want the best workflow. LightWave artists are modeling, animating, and rendering faster. They can push out the work. Finally, software is like buying art - it's more handcrafted and not produced by an assembly line. LightWave is designed to be efficient and fast - and to be an artist tool. When people see what can be done with 6.0, they will be blown away."

LightWave's Ying and Yang

Allen Hastings and Stuart Ferguson have been writing computer programs together since they were freshmen in high school. "We met in 1976 before *Star Wars*," Hastings said. "We were anticipating it a month before it came out."

For this interview, Stuart and Allen are taking a break from their usual routine at their home offices, and are enjoying a balmy afternoon over an al fresco Italian lunch. On this day, about a month after *The Phantom Menace* premiered, the creators of LightWave discuss their history and their humble program that has launched as many spaceships as George Lucas.

"We hung out in the computer room at school. We hooked into a HP3000 with an acoustic coupler," Hastings continued. "We wrote BASIC code for printing an array."

"You think the Internet's slow," Ferguson added, "try doing 3D graphics on a teletype."

One of their first programs would print out the *Star Wars* trench with a tye-fighter in it. "You could type in new coordinates and make a steering correction, and it would print out the new image," Hastings said.

"I remember we wrote some code that we thought was compact," Ferguson said, "and some older kid rewrote it in two lines."

After high school, Hastings went to UC Santa Cruz and Ferguson went across the Bay to UC Berkeley. "I did a lot of software design and made a text editor," Ferguson said. After college, both of them ended up working at Lockheed.

"I bought my first Amiga in 1985," Hastings said. "I met Tim Jenison at an Amiga developers conference in Monterrey in '86. I had already made two films at home with my own software, and I was about ready to sell the software to Aegis Development. They published VideoScape 3D in the summer of '87. My program did animation but not modeling. VideoScape 2.0 came out in early '88, but I didn't have a very good relationship with the publisher, and technically, the program was at a dead end."

At the same time, Ferguson wrote a 3D graphics editor, Modeler 3D, that was also bought by Aegis. "The deal kind of soured," Ferguson said.

In the Spring of '88, NewTek came and asked Hastings to do a whole new 3D program. "I foolishly said yes," Hastings joked. "It was intended to be a product without a 3D modeler. I decided it would be a bad idea not to have a modeler, and I decided I needed Stuart to do it."

"I wasn't too hard to convince," Ferguson added. "The only thing that got in the way was having a day job."

"We were producing demos in late '88," Hastings said. "I thought of the LightWave name in '89. At SIGGRAPH in '90, Todd Rungren found our group and picked us to work with him." NewTek hired Hastings to go help Rungren create the music video *Change Myself*. "I met Ron Thornton at Todd's. We hit it off immediately."

Version 1.0 of LightWave was released in January '91. "We did a lot of bug fixes and 2.0 followed quickly," Hastings said. "3.0 was a more serious release."

At first, Ferguson was programming Modeler in his spare time. "But it was not enough time to do it justice. Tim hired me in about '93 and I have been working full time for NewTek ever since," Ferguson said. NewTek never could entice Hastings and Ferguson to leave California. "My wife is proud that I invented Booleans on her kitchen table," Ferguson commented.

One of the first high profile projects for LightWave was *seaQuest*, the Amblin Entertainment television show. "Some weeks, I would go down twice just to reassure the nervous producers," Hastings said. "I've been the more reactive one. Stuart is more into the planning."

"I tend to work more behind the scenes," Ferguson confirmed. And with the last bite of dessert, the two complementary talents quickly excuse themselves - they have a sixth floor to finish building.

The LightWave Developers: Collaborative Art

In the beginning, LightWave was developed almost exclusively by Allen Hastings and Stuart Ferguson. "Until 5.0, we were pretty much on our own," Hastings said. "Occasionally, we would subcontract something out."

"We started finding people who were really, really good and we wanted to bring them in," Ferguson added. "They had to be people with promise. You just can't bring in warm bodies."

"Software development is a collaborative art," said Brad Peebler, the manager of LightWave's development team. "We are very careful about the way we grow our team. We don't have a lot of junior-level programmers. Doubling the size of the team doesn't necessarily double your productivity. I want slow growth. If you're too large, the senior programmers become managers and the junior engineers do the programming. All of our top level engineers are writing programs."

"It bothers Kinetix because we're such a small team. They can't get leaks and they are jealous about how fast we can work," Peebler said. "We are the rebel alliance - a guerrilla force hiding in the trees."

These days, the LightWave lair is in the concrete jungle known as San Francisco. Even when NewTek was in Topeka, Ferguson and Hastings always were based in the Bay Area. When NewTek moved to San Antonio, the decision was made to consolidate the LightWave forces in San Francisco.

"San Francisco is just working out fantastic," said Tim Jenison, NewTek's founder. "I can't ask for better."

"Tim has a tremendous amount of trust in us," Peebler said. "His plate is the size of Texas. He's glad that he doesn't have to be a part of this. We work closely with the marketing group at NewTek. We also give a lot of feedback to the video side. For example, Jamie Finch worked on the HDTV

TO THE HEAVENS

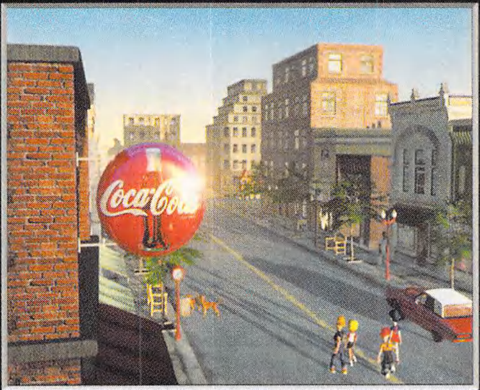
GRAHAM McKENNA

DREADLOCKS

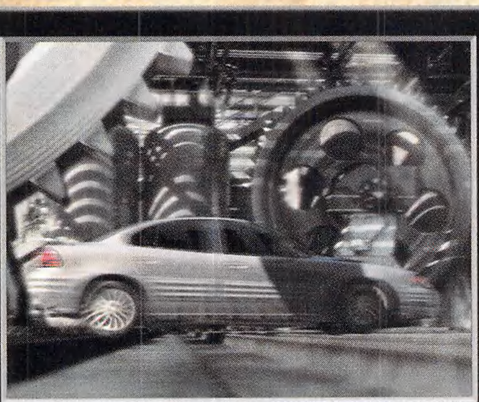
HENRIK ANDERSSON

LA BRUJA

TJ NABORS



COCA-COLA
IMAGINATION IN MOTION



PONTIAC
DIGITAL DOMAIN

Breadsticks
Dinner Rolls
In the Dairy Case

PILSBURY
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player. Jason Linhart is a great integrator of the video and LightWave."

Though many of the programmers write code from home, the base camp is set up on the third floor of an old dance club in downtown San Francisco. The only distinguishing element, among the cluttered cubicles full of computers, was a miniature smoke machine that puffed away intermittently and provided real-life volumetric study material. Definitely, the Feng has not Shuied here.

But interior decor is not the attraction - it's brainpower. "Everybody in this business respects Allen and Stuart," Jenison explains. "They are a magnet. People want to work with them."

"We have found some geniuses who are not interested in working for a large company," Peebler added. "Also, every one of our developers has created animations - some have won awards. Gregory won an award at Imagina for best graphics."

Gregory Duquesne

Gregory Duquesne is a French engineer who was hired to create a multimedia division for Casterman, the publishers of the internationally popular *The Adventures of Tintin*. "Their idea was to work on a Myst-like program. I did all the graphic design. I initiated the project and worked with Grid Productions to do the animations," Duquesne explained.

"When we were working on *Amerzone*, we were looking for the best software. We used Alias for awhile, and we were pretty interested in Softimage. Finally, because of the price of the software, the machines, and the people to run them, we discovered that LightWave 4.0 was the best choice. 3D Studio was too crude and everything else was just impossible because of the budget."

"We needed volumetrics for the project - it was pretty important. I used the software developers' kit (SDK) to make a shader, which the first volumetric was based on. It was very limited, and only intended to be an in-house product. I wanted to show some images to Brad, and saw him in Amsterdam at the IBC Conference," Duquesne said. "This guy tapped me on the shoulder and said, 'I would like to show you what I have been working on.' I was blown away," Peebler added.

"I gave him the plug-in and we kept in touch," Duquesne said. "I met the guys from NewTek at Imagina the same year. When I stopped working for Casterman, I started working for NewTek. I had to wait six months for my work visa."

Duquesne is now in San Francisco and the result of that fateful tap on the shoulder is the Hypervoxels technology. For 6.0, "volumetrics are integrated deeply into the rendering engine," Duquesne said. "Any volumetric object is automatically rendered."

"I'm also trying to design the SDK so you can create shaders without having to recreate the wheel for textures," Duquesne added.

Arnie Cachelin

In comparison to Duquesne's transatlantic flight to join the LightWave development team, Arnie Cachelin, NewTek's Haiku Yoda, only had to walk down the street, with a detour to Topeka. "I went to school at Wesleyan at Middletown Connecticut," Cachelin said. "I received my B.S. and M.A. in Physics. After working on my Ph.D. in Boulder, I moved to San Francisco and wrote for Amiga Plus magazine as a technical editor from 1988 to 1990. I worked about five blocks away from here."

"I was programming on the Amiga when the Toaster came out. I already had been talking to NewTek about Digi-View and Digi-Paint reviews when I was at the magazine," Cachelin explained. "I moved to Topeka in October

1992. They told me then, 'Just one more version and we're moving.' I believed them."

"I was inventing new ways to do effects for the Toaster. I did the breaking glass effect by hand in DPaint. It was based on childhood slingshot misadventures," Cachelin joked.

For the enjoyment and edification of harried animators, Cachelin also introduced the Haiku generator into Modeler. "It was an ARexx example that I found in a book. Recently, I won a haiku contest sponsored by Salon magazine on the Microsoft trial," Cachelin said. "My entry was, 'Innovation like a river must be restrained to produce power.' I won a book on bots by the editor of Salon."

"Getting the Flyer and Toaster 4.1 ready for release was really grueling. I was fed-up. I was an expert at LightWave plug-ins and it was time to escape Kansas," Cachelin admitted. So he moved back to San Francisco. For 6.0, Cachelin has been working on low-level coding for the new and improved motion and surface editors.

Cachelin is also NewTek's expert on the Virtual Reality Modeling Language (VRML). "Arnie worked with the VRML board," Peebler said. "There is a full implementation of the VRML2 specifications in LightWave."

"I did all the VRML coding. I just think it's cool," Cachelin enthused. "I read *Snow Crash* (the novel by Neal Stephenson) and got excited about space in virtual reality."

As for his immediate future, Cachelin said, "I want to keep going - there's no chance to stop. All this low-level stuff is making me eager to do high-level work such as character animation, for example, coordinating the behavior of multiple objects. If we can develop a set of higher level commands, we could tell a character to walk like you're angry or distracted."

Matt Craig

For Matt Craig, the road to NewTek was just a matter of hiding in plain sight. "Matt's dad was our second grade soccer coach," Peebler said. "We went to rival colleges - I went to the University of Kansas and he went to Kansas State. Matt has an undergraduate degree in Physics and a graduate degree in Computer Science. It never dawned on us to use him. When we were doing our Sun port, we were looking for someone who knew how to do multithreading on the Sun. I had been talking to Matt, and asked what he was doing."

"I was working on my Masters thesis about parallel processing architecture on the Sun," Craig said.

"He also did the Mac multithreading, and eventually he came on board," Peebler added. "He has stabilized the Mac port and added OpenGL support for it."

"LightWave 5.6d, for the Mac, is just as stable and dead-on as for the Intel," Craig said. "With 6.0, Mac will be OS X ready. When that happens, the Mac will easily be better at running LightWave. We're renewing our ties with Apple. Now with Final Cut, they're more interested in getting into 3D. LightWave on my 333 iMac is faster than on my fastest development machine."

"I started working in the Topeka office after graduation in mid May 1997," Craig said." We left for San Francisco in June. Working with Allen and Stewart is an amazing experience; it's a great working environment here. I have a lot of responsibility. There's no bureaucracy - we do what needs to be done. A lot of the time, we're pretty isolated. We all trust each other not to mess each other up. It's very important."

"We live very much in our own world and don't worry about what's going on in San Antonio. Brad has said no calls to the programmers," Craig continued. "We're just concerned with LightWave."

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When the Master Speaks

BY DICK DE JONG AND MOLLY DINKINS

Building a Better Toaster

Tim Jenison, NewTek's grand visionary, walks into the conference room, picks up a marker and reminisces about NewTek's history, contemplates the future, and communicates by alternating between word and pictogram. He draws a cryptic square pointing to a circle and a far-ranging interview begins.

If the Toaster was the beginning, then "I'm halfway to my vision," Jenison figures.

"The Flyer was a big exercise in frustration," Jenison admits. "We were three-quarters of the way through when the Amiga died. We announced the Flyer at NAB, and the next week Commodore went bankrupt."

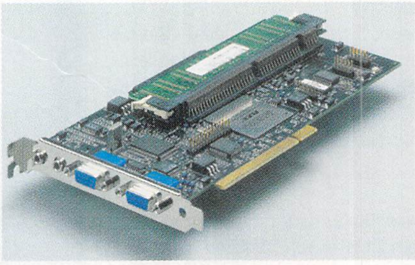
"The original plan for the Flyer was quite a bit more ambitious. If you clicked on a crouton, a time line would open. We never got that far. The end result was not a good way to handle audio. It kind of worked."

"It was drudgery getting it shipped. We had to finish it to get on to the next thing. The whole Amiga experience was coitus interruptus."

Despite a few more upheavals - the move from Topeka to San Antonio, the entrance and exit of key personnel, and the present pressures of an impending milestone delivery date - Jenison narrates NewTek's history with a professorial calm. "NewTek has been on a roller coaster ride since Day 1."

The next big thrill on NewTek's perilous path is the Video Toaster NT (VTNT), NewTek's uncompressed video capture card and non-linear editing package. One of the recent alliances that NewTek has formed is with in-sync, the makers of Speed Razor - the non-linear editor that is bundled with VTNT.

"We got together with Speed Razor about eight months ago. There is a big demographic overlay between Speed Razor and LightWave. For example, Foundation Imaging uses Speed Razor. It is a lot faster than Premiere. More importantly, Speed Razor was anxious to work with us. Other brand name editors like Avid and Discrete were off limits. Also, Speed Razor users are kind of like the Toaster culture. Take a look at the pigsfly.com website."



Video Toaster NT

Jenison is now back at the whiteboard, drawing squares and squiggly circles and explaining the current business climate.

"When the Toaster came out in 1990, it was this box. You had your tape decks and you were pretty much an island unto yourself."

"Over here you had Avid, and Wavefront, and 3D Studio, all of them just kind of had their users. Now, everything is expected to be interconnected. Content has to go back and forth. This is the new reality. Competitors have to cooperate - 'coopetition'. You're not just an island anymore."

Showing his rock and roll roots, Jenison says, "I would like to sell Toasters through music stores. Ten years ago you would go into music stores, and find Fender amps and guitars; now, there are Mac and PC workstations in there. These workstations do not support video very well. They're not very sophisticated. We are looking to sell to the garden variety production studios."

"Like the original Toaster, the new Toaster is way too good a deal. Which attracts a lot of customers, but actually repels others."

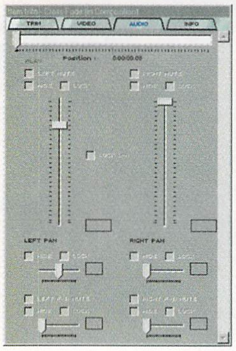
Jenison then lays out the technological road map for VTNT. In it's initial incarnation, the VTNT was called Frame Factory which was released at the end of 1998.

"When we first made Frame Factory, we used our RTV format because it was very efficient. Now we're able to go way past that because computers are way faster. The original Amiga was running at 8 MHz and it could do about one MIP. Now the machines are running at 500 MHz and can do over 500 MIPs."

"In 1995, I got the idea that I would be able to do DVE's and alpha channels in real-time. The Frame Factory now needs 21 MB per stream. It can support several streams, four of them, through the PCI bus. To run dual streams you need disk arrays capable of 42 MB per second."

"The editing architecture that we're planning will use one array at an arbitrary speed (hopefully more than 21 MB). As soon as the user makes the decision, the CPU goes and pre-reads the end of the A edit and the beginning of the B, and builds it faster than real-time. This way is much more flexible. The real payoff is that we can move the entire thing over to HDTV. We think that the new architecture is definitely the way to go. HDTV will work when the computers can do our software thing. You're going to have to use fibre channel hard drives for HDTV."

To help build the editor, Jenison hired

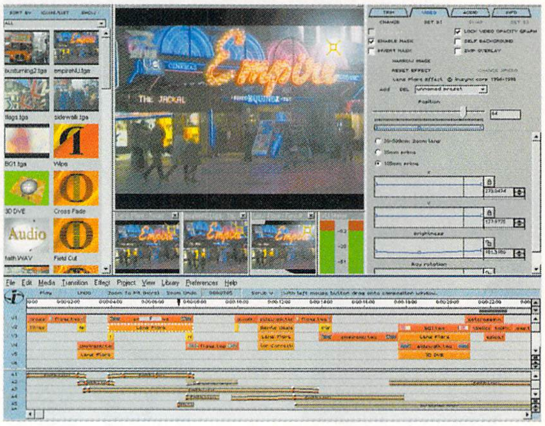


Andrew Cross, an English engineer and the designer of Genesis VFX. "Andrew was a once-in-a-lifetime find. His resume came across my desk a while back. It said that he had a Ph.D. in computer graphics from York University, 11 years experience doing computer graphics programming, and he was 24 years old. I said, 'I want to meet that guy.'"

Right now, most of Cross's work is still in the development stage. "The important thing is to get the low-level code to work reliably," Jenison says. "We're concentrating our efforts right now on that. We're trying to get the downstream keyer and the real-time effects engine to work reliably on all computers. This is the hard part. None of our competitors are working on it. Other people who do this stuff are using hardware."

"I'm not interested in coming out with a DV editing system. D1, 4:2:2, is our language. People are betting companies on DV editors. If you limit yourself to DV, you're in trouble."

"Our new D1 switcher will have 16 inputs, and you could have a chassis with 16 DV inputs. Then you could hookup 3 DV cameras for a mini studio. People who know firewire will say it won't work, because firewire cables can only run 15 feet. But if you're careful, you can extend that."



"The Toaster might be a pretty powerful teleconferencing tool when the Internet speeds up. Teleconferencing right now is an altered state, a Quaalude vision. It won't be hard to control the switcher over the Internet. I have no idea what the world is going to be like in ten years when people are that connected."

"We are working on more integration of LightWave into the production environment. We want everything to be in real-time. The user interface will be more virtual reality like. Virtual sets are getting more practical."

"The fundamental thing is that you're making a TV show. To me it's a bad investment to go crappy. It seems like it behooves you to make it broadcast quality. We need to concentrate on making high-quality video production tools. In geologic times, it's a short jump from DV to HDTV."

Jenison, in his matter of fact manner, simply explains his raison d'être, "I want to take over the world of video."

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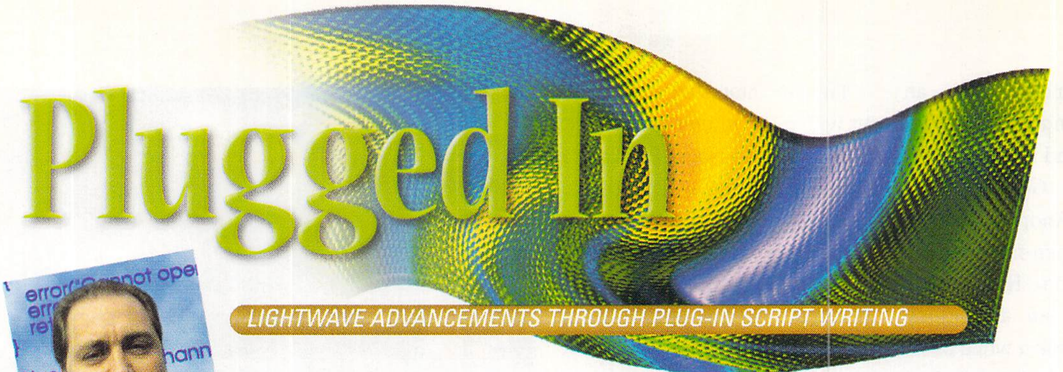

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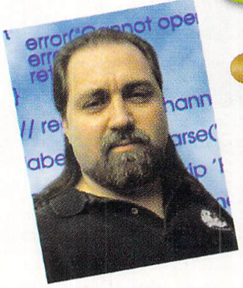


LSCRIPT PROBLEMS AND SOLUTIONS

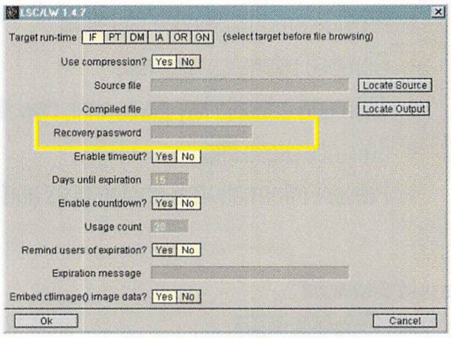
Answers to reader questions about using LScript.

BY BOB HOOD

It's time once again to take a break from our labors and examine some LScript specific reader questions.

Is there a decompiler for LScript lsc files, so that I can regenerate source code from compiled scripts?

No, there isn't a decompiler available for compiled LScripts. If there was I would know, because I would probably be the one who wrote it. In a normal compiled LScript file, the chances are extremely poor that you could regenerate your original LScript. The source code is not kept in the file by default. Even if you were keen enough to reverse-engineer the byte code, the source code would most likely not be exactly the same as the original, though it might create a working LScript.


LSC/LW 1.4.7

Target run-time IF PT DM IA OR GN (select target before file browsing)

Use compression? Yes No

Source file — Locate Source

Compiled file — Locate Output

Recovery password

Enable timeout? Yes No

Days until expiration

Enable countdown? Yes No

Usage count

Remind users of expiration? Yes No

Expiration message

Embed ctlimage() image data? Yes No

Ok — Cancel

Figure1. The Recovery field of the LScript Compiler

There is a Recovery feature available in the LScript compiler (introduced in v1.3), however, scripts must be compiled with this feature enabled for such recovery to be possible. Figure 1 highlights the specific control on the LScript compiler options panel responsible for enabling recovery. If this field has a value when the script is compiled, the LScript compiler will embed the source code directly into the compiled binary file.

The source code is encrypted using a provided password. If you plan to use this option, then it is important to be aware that the password you use is not made part of the resulting file (for security reasons). So, if you forget the password, the source code can never be extracted from the binary file; not even by NewTek's staff.

Is there a way to determine the current frame number in Generic LScripts?

Layout's Generic plug-in architecture differs from all other Layout plug-in types, in that it can only be executed when Layout is idle. In fact, Layout Generic scripts and plug-ins can only be executed manually.

Because of this, the concept of "current frame" really doesn't apply to this type of plug-in. When a Generic script/plug-in executes, the only "current frame" in Layout is in the preview mechanism; but, Layout does not make this information available to plug-ins. This means, of course, that it is not accesable from scripts.

How do I assign the same IA script to multiple objects, and without having variables shared between the scripts?

Unfortunately, there is no way in LightWave Layout to apply plug-ins to objects in this type of batch fashion. If you have too many objects in a single scene to process by hand, then you will probably have to resort to direct scene file editing. Only in this way can you assign the script to each object in an iterative manner.

SceneMan, an LScript Object Agent, can aid tremendously with this type of batch processing of LightWave scene files. SceneMan will take a LightWave scene file and provide you with a programmatic interface to its components. This allows you to use LScript features, such as loops, to perform complicated processing of all the items in a scene.

Listing 1 is a complete Modeler script that uses SceneMan to apply a specific Item Motion LScript to each object (be it Mesh or Null) in a scene file. There was no specific reason I chose Modeler as the application to run this script; it could have also been written as a Layout Generic script. Indeed, as a Generic script, it would have the power to load the newly created scene file directly into Layout immediately upon completion.

Listing 1:
Using SceneMan to batch apply a plug-in

```
@insert “SceneMan.inc”
@warnings
@version 1.4

// the complete path to your script
@define SCRIPT  “c:\\myscript.ls”

main
{
sceneFile = getfile(“Select scene...”,”*.lws”);
if(!sceneFile) return;

scene = SceneMan(sceneFile);

count = scene.objectCount;

objNdx = 1;
while(objNdx <= count)
    {
objId = scene.objectID[objNdx];

scene.addExtra(objId,
“Plugin ItemMotionHandler 1 LScript/IA”,
“Script “ + SCRIPT,
// script parameters should go here
“EndPlugin”);

++objNdx;
    }

scene.save();
}
```

As for sharing variables, each instance of the LS/IA script that we apply in Listing 1, has its own copy of the variables that are defined within the script. In order to make the values of these variables visible to other LS/IA instances, or other active LScripts, they must be explicitly published using LScript's IPC Queue mechanism.

SceneMan, and other LScript files and documents, are available through the Download section of this issue's online bonus area.

Is it possible to have a pop-up window, such as info() or warn(), opened while inside of a requester?

Yes. Using a control call-back function (introduced in LScript v1.4), you can display one of these types of pop-up windows, while a LightWave Panels requester is active.

Of those available, the ctlrefresh() function would best illustrate this technique. Listing 2 shows a short Modeler LScript that uses LightWave Panels to generate a requester. The ctlrefresh() function, at line 10, attaches the user-defined function range() as the refresh function for the only control on the panel. This refresh function will be called whenever the value in the control(s) is altered by user input.

In this script, we use the range() function to ensure that the value entered into the control, by the user, falls within some pre-defined range. If it does (line 18), then the function simply returns.

However, if a violation is detected, then the function posts a warning message to the user using the warn() function (line 20). This pop-up window will display over your main requester panel. When dismissed, we set values into the control that are more acceptable, and allow the user to continue to interact with the requester.

Notice that, because we need to modify the value of the control in the range() function, the control identifier 'c1' is made global (line 1).

Is there any way to give random() and randu() seed values, so you can always get the same random numbers when you want them?

In the case of random(), no, it does not accept parameters. In fact, if you provide any parameters to it, a run-time error will likely be generated.

Listing 2:
Displaying a warning message over a requester

```
01: cl;
02:
03: main
04: {
05:     if(!reqbegin(“Panels Test”,true))
06:         return;
07:
08:     c1 = ctlinteger(“Value (1-10)”,1);
09:
10:     ctlrefresh(c1,”range”);
11:
12:     reqpost();
13:     reqend();
14: }
15:
16: range: value
17: {
18:     if(value > 0 && value < 11) return;
19:
20:     warn(“Control value (“,
21:         value,
22:         “) exceeds defined boundaries”);
23:     if(value < 0) setvalue(c1,1);
24:     if(value > 10) setvalue(c1,10);
25: }
```

However, the randu() function does accept a numeric parameter, specifically for the purpose of seeding the random number generator. Using the same random number seed with randu() will always generate the same sequence of numeric values.

The seed value you use with the randu() function will also apply, indirectly, to the random() function:

```
randu(seedValue);
x = random(10,45);
```

In this way, random() will generate the exact same numeric sequence for each unique value of 'seedValue'. Using a known seed value for random numbers will allow you to re-create an action or effect the same way every time it is used.

I'm having problems using readVector(). I seem to be getting very odd results. What am I doing wrong? To write to an

ASCII file, I'm using: tempfile.writeVector(...);

The immediate problem here is that the File writeVector() object method is intended only for files that have been opened for binary access, not ASCII (text). So, when the vector is written, the results are "undefined" (writing binary into an ASCII file is incorrect, and can cause problems).

With ASCII files, such as scene files, you must use the read(), write(), and writeln() File functions instead. Vectors stored using these methods are placed into the file in ASCII format. Consequently, however, they must be converted back into their binary equivalents when they are read back into the script. This ASCII-to-vector conversion is done using the vector() LScript function:

```
str = file.read();
vec = vector(str);
```

Similarly, you could use the data type method asVec() to convert the string date into a valid LScript vector:

```
str = file.read();
vec = str.asVec();
```

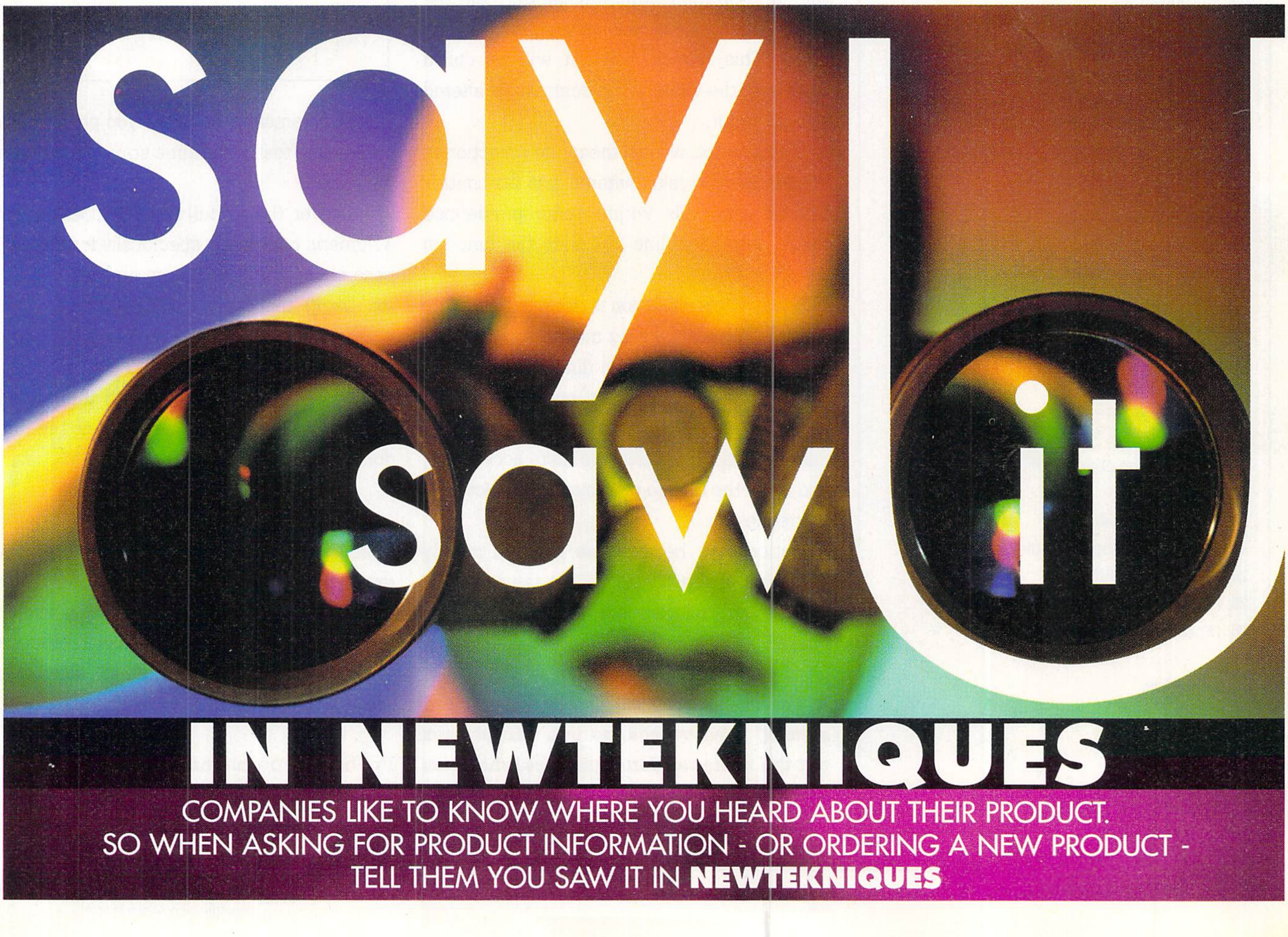
I am opening a model file and want to check that it is a LightWave model before continuing. Is there a way to confirm that it is?

The readByte() File function is a good candidate for this type of file access. If you look at a LightWave model file, the first four bytes in the file will be the ASCII characters: "F", "O", "R", and "M". So, in a simple test, you might read these four bytes from the file like this:

```
if(f.readByte() == 'F' &&
f.readByte() == 'O' &&
f.readByte() == 'R' &&
f.readByte() == 'M')
```

In simple cases like this, LScript can be trusted to execute the expressions in the if() statement in the order in which they appear. Therefore, we can call the readByte() function repeatedly, comparing the results to the individual byte values we need, in a single test. While this will usually be sufficient to test if a file is a LightWave model or not, you may want to read further into the file for additional confirmation. The first four bytes of the file are the characters "FORM", followed by four bytes of size information. The next four bytes represent the actual type of the file, and should be "LWOB" (or "LWO2" for LightWave v6.0). These two ASCII character sequences together, "FORM" and "LWOB", are definate indicators that the file was generated by LightWave Modeler. NT

Bob Hood is a Senior Software Engineer at NewTek. You can email him at bhood2@home.com



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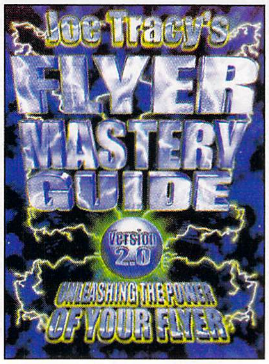

Some dealers are now bundling this book with new Video Toaster Flyer systems.

"Simply Amazing! Who knew my favorite leisure reading would be a technical manual!"

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Earl Chessher of CORELANN Productions

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LightWave 201

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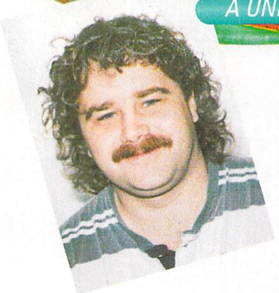


ALIEN ABDUCTION:

Lights & Action

BY
SCOTT WHEELER

Welcome back to LightWave 301. I hope last issue's absence did not cause too many problems for everybody. To make up for that, we're doing a longer tutorial this time around that will get us back on track. In this session, we will be adding some texture to our UFO as well as adding lights and motion. I'm sure you're anxious to get this ship moving, so let's get to it:

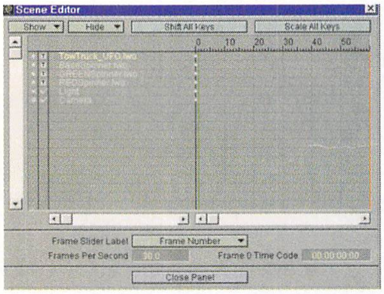
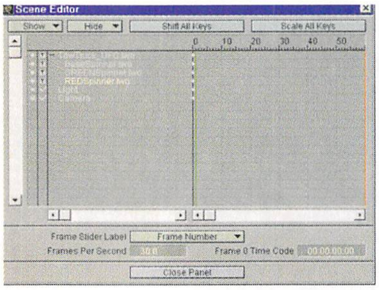

Scene Editor
Show
Hide
Shift All Keys
Scale All Keys
0
10
20
30
40
50
TowTruck_UFO.lwo
Frame Slider Label
Frame Number
Frames Per Second
30.0
Frame 0 Time Code
00:00:00:00
Close Panel

Figure 1


Scene Editor
Show
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Shift All Keys
Scale All Keys
0
10
20
30
40
50
REDSpinner.lwo
Frame Slider Label
Frame Number
Frames Per Second
30.0
Frame 0 Time Code
00:00:00:00
Close Panel

Figure 2

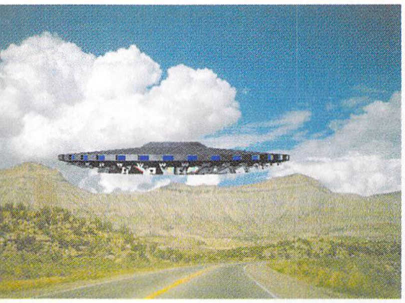


Figure 3

NOTE: Files required for this part of the tutorial are available from the Downloads section of this issue's online bonus area.

1. Start LightWave and click [Add] under the Edit Menu to load in the four parts of the UFO we created previously. They should be:
   TowTruck_UFO.lwo
   BaseSpinner.lwo
   GREENSpinner.lwo
   REDSpinner.lwo

2. Let's Parent the spinner sections to the UFO. The most visual way to do this is to open the Scene Editor. With all the objects loaded in, your panel should look like Figure 1. Select the "BaseSpinner.lwo" object by clicking on it. You will know you have it selected when it's color changes to yellow. We can attach this object to our UFO by selecting [Parent] from the left side menu and selecting the "TowTruckUFO.lwo" as the Parent Object. Repeat this procedure for the other two spinner objects. If all went as planned, the Scene Editor should now look like Figure 2. The panel now shows the three spinner objects indented under the "TowTruck_UFO.lwo" and a small dash next to the UFO object. These are all indications that a hierarchy exists.

3. Now would be a good time to save our scene. Save it as "Abduction.lws" or whatever you would like to call it. Just make it clear enough so that you will know what it is by looking at the file name. Nothing can be more annoying than sifting through a list of scenes named "Work-01try7.lws" or "Test_Messedup_rework05.lws" to find the scene you want. It may not be as big a problem when you are working on your own system, but, when you are working with a group of people, making things as clear as possible is always a good thing.

4. As you may have noticed from the final image shown last class, the backdrop is going to be a picture of a remote desert road.

   In order to use them for our shot, we will need to load them into the scene, so lets do that. Open the Images Panel, select [Load Image] and load in "Mountains_Day.iff". Repeat the load procedure, to load in "Mountains_Night.iff".

   Since the night scene is considerably darker, we will

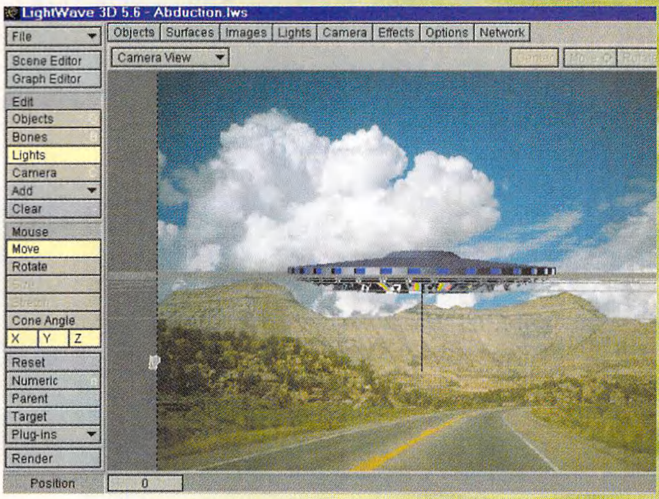
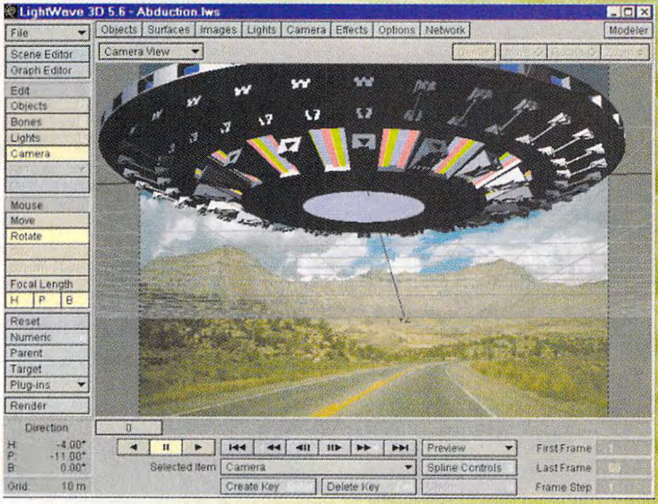

LightWave 3D 5.6 - Abduction.lws
File
Objects
Surfaces
Images
Lights
Camera
Effects
Options
Network
Scene Editor
Graph Editor
Camera View
Edit
Objects
Bones
Lights
Camera
Add
Clear
Mouse
Move
Rotate
Cone Angle
X
Y
Z
Reset
Numeric
Parent
Target
Plug-ins
Render
Position
0

Figure 4


LightWave 3D 5.6 - Abduction.lws
File
Objects
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Modeler
Scene Editor
Graph Editor
Camera View
Edit
Objects
Bones
Lights
Camera
Mouse
Move
Rotate
Focal Length
H
P
B
Reset
Numeric
Parent
Target
Plug-ins
Render
Direction
0
H: -4.00°
P: -11.00°
B: 0.00°
Grid 10 m
Selected Item
Camera
Create Key
Delete Key
Preview
Spline Controls
First Frame
Last Frame
Frame Step

Figure 5

Day Becomes Night

Our starting Image is called "Mountains_Day.iff". Since we want our UFO scene to take place during the night, I needed to process this image a bit to get it to the state I wanted.

If you take a look at the "Mountains_Night.iff" image you will notice that for the most part, it is black with the bottom portion around the road in the foreground darkened; but not as much as the rest of the image. Upon closer inspection you'll see that there is some detail still left in the top portion of the image. This will be drawn out of the image by the lens flares of the UFO. The lighter section of the street will also be raised in intensity by the lens flares and will act as the spill light from the UFO's main tractor-beam light.

be placing the camera and other elements using the "Mountains_Day.iff" image as the background; later we'll be swapping it for the "Mountains_Night.iff" image to do the lighting and final rendering.

5. Since we are going to be using a Background Image, the positioning of our camera needs to be made in relation to that image in order for the whole shot to work. Therefore, lets open the Effects Panel and select the Compositing tab. On the Compositing tab, is the [Backdrop Image] pop-up, this is where we want to place the "Mountains_Day.iff" image.

We now have an image for the backdrop, if we render a frame [F9], it should look like Figure 3. That's all fine and dandy; but, what we want is to be able to see that image in Layout without having to render a frame to check placement of things. We accomplish this by opening the Options Panel and going to the Layout View Tab. Set the [Layout Background] to [BG Image] and close the panel [p]. Your display should now look very similar to the previous rendered output (Figure 4).

As a matter of habit, Save [Shift-s] the scene file.

6. Make sure the view is set to Camera View [6] so we can see what the camera sees.

Note: This will be one of those times when the scene creation doesn't fit with the real world in quite the way that it should. In all endeavors, one should strive to make things as close to reality as possible. Unfortunately, in a production setting it is sometimes beneficial to forsake reality for what gets the shot done faster. In this case, it was less work to simply move the camera, rather than to reposition the camera and realign the UFO to match the camera's new position. I know this is not the best way to do it; but, I did get this shot done in a day.

We want the UFO to be hovering over the road, and to have the correct perspective on the shot. The first step in this process is changing the lens to the proper focal length to match the background plate. To do this, we need to open the Camera Panel to change the camera settings.

As luck would have it, the default Lens Focal Length of 24 mm is correct. Before we move on though, lets adjust the rest of the camera settings for this shot:

Segment Memory: 8700000
Antialiasing: Low
Soft Filter: On
Motion Blur: On
Blur Length: 50%

Note: Feel free to turn off motion blur and antialiasing for your test renders; but, keep these settings in mind for your final renderings.

When you're done, close out the Camera Panel [p].

7. Select the Camera as our active object [Shift-c]. Open up the Numerical Requestor for Move [n] and input the following values:

X: 4 m
Y: -14 m
Z: -45 m

Close the requestor by clicking [OK]. Now we need to rotate the Camera up to look at the UFO. Switch to Rotate [Spacebar], open the Numerical Requestor for Rotate [n] and enter the following:

Heading: -4.0
Pitch: -11.0
Bank: 0.0

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NewTekniques online

CONTENTS

Volume 4, No. 4, August/September 1999
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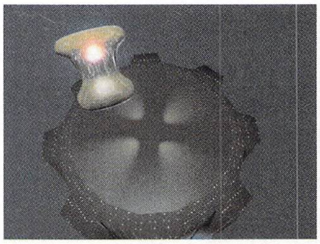
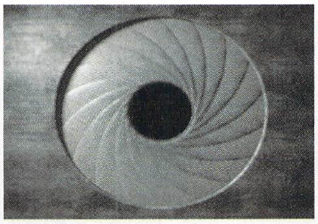
NEWTEKNIQUES



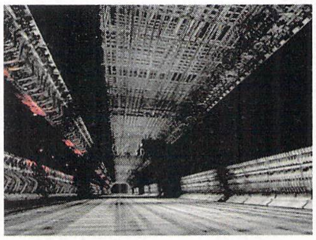
LightWave Fundamentals: Landings With Ease - It's time to enter the world of science fiction, in this continuing introduction to LightWave 3D by Jared Brookes. This time, learn to construct basic objects and do simple animation, as you recreate a police vehicle landing sequence from Blade Runner.

Tutorial: Green Grass Grow - Now that you've learned how to create realistic fur in LightWave 3D, Dave Jerrard teaches you how to use a similar technique (the 3 Gs of 3D) to make Green Grass Grow.

Opening August 31!

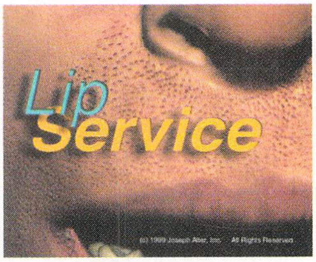


Tutorial: Iris Doors, Part 2 - No self-respecting spacecraft, alien corridor or intergalactic waste control system would be complete without a set of iris doors. Scott Wheeler teaches you how to make them in LightWave.



Tutorial: Modular Scene Design - Using pre-fabricated parts is a big time saver for the construction business. Jared Brookes teaches you how to apply this idea to LightWave to build elements that can be re-used in several scenes, quickly and easily.

Reviews:



Lip Service - A facial animation system for LightWave 3D (Windows NT).

THE GATEWAY

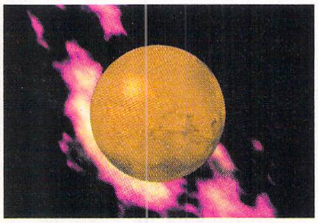


Image Effects: Terraforming Mars - We're off for another great adventure with cecilia and ImageFX. This time we're going into space to do some Mars terraforming. Right before your eyes... barren Mars will trickle up oceans and grow over with lush foliage, into a thriving liveable planet.

Silicon Alchemy: Information Appliance? - If you're following computer/internet news at all, you've likely come across references to the term "Information Appliance". What does it mean? Is it a good thing, or a bad thing? How does it fit into the future of the internet? What does it mean for future Amigas? Dave Haynie answers these questions and many more.

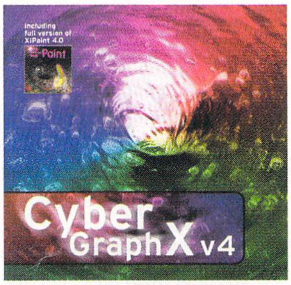
The Idea Factory: The Armchair Tour - If you're looking for new ideas to expand your video business, Bob Ketchum is your man. In almost every city or town, Bob says there's always three things you can count on finding: a church, a gas station, and a real estate office. One of those is a great business opportunity waiting to happen, and Bob will tell you all about it.

Business Matters: Time To Grow - It's time to make your business grow! The long term outlook of your company depends on your active involvement in expanding your business. Advertising your services is part of the process, but it's not the only way. Kevin Hanley shares his ideas on making your company more successful.

The Producers' Lounge: Kermit Woodall is back with more information and resources of interest to videographers.

Reviews: Pan Canvas - Motion Control for ImageFX (Amiga).

PowerStation Vol. 1 - PPC Modules for ImageFX (Amiga).



CyberGraphX 4 - Retargettable graphics software (Amiga).

Movie Effects Studio
PYROMANIA!
(PLAYING WITH FIRE on CD-ROM)
AMIGA

Pyromania - Fire and explosion images/animations (Amiga/Flyer).

The Gateway

Amiga Changes Next Generation OS Kernel

November 13, 1998 - Cologne, Germany - After much anticipation, Amiga Inc. made the announcement at the Computer '98 show of a "partnership with QNX Software Systems Ltd. to utilize the QNX real-time operating system (RTOS) as the foundation for the next-generation Amiga architecture." The announcement went on, "Founded in 1980, QNX Software Systems is one of the top three real-time operating system vendors in the world, with products licensed in more than a million systems worldwide."

July 7, 1999 - Ottawa, Canada - QNX Software Systems announces a new Amiga developer program, "Last November at Computer '98 in Cologne we promised to deliver an advanced operating system that would once again put Amigans at the forefront of technology. Over the past 7 months we have had a team of over 40 engineers working towards making that promise and vision a reality. We are now in the final stages of development and are poised to put these new technologies into the hands of thousands of serious, enthusiastic developers."

July 9, 1999 - San Diego, California, USA - In a surprise turn around announcement, Jim Collas, President of Amiga stated, "After months of research and in-depth discussions with all of our technology partners we have decided to use Linux as the primary OS kernel for the new Amiga Operating Environment (OE)."

Phase 5 Announcements

July 22, 1999 - Kanata, Canada and Oberursel, Germany - QNX Software Systems and phase 5 digital products announced a licensing agreement that allows phase 5 to port the QNX Neutrino OS to its current line of accelerators for Amiga (classic) computers.

July 22, 1999 - Oberursel, Germany - phase 5 announced the new AMIRAGE K2 multimedia computer. "Based on our license agreement with QNX Software Systems Ltd., we are now able to provide our customers with a powerful realtime OS with all the necessary functionality - and much more - that can make a next-generation multimedia computer fly" said Wolf Dietrich, General Manager of phase 5.

Amiga Announces Relationship with Corel

July 22, 1999 - San Diego California - Jim Collas announces, "We are extremely excited about our relationship with Corel [Corporation] and their entire product line. This insures that our customers who purchase the new Amiga systems will have world class personal productivity applications such as the upcoming WordPerfect Office for Linux."

Amiga Promotional Products

In addition to the Amiga Matches, introduced awhile ago, some new promotional products have been announced: AmiCola (the cool drink for for all Amiga freaks), Amiga boxer shorts, and Amiga socks. All products include the Amiga Boing-Ball logo.

Amiga OS 3.5 Update

The new OS is scheduled to be officially released at the AMIGA Downunder '99 show in Canberra, Australia on August 21. Public beta testing of Amiga OS 3.5 began on June 16, 1999.

Amiga Video Contest

Amiga is holding a contest for the best video trailer for the new Operating System 3.5. The video must be completely made with Amiga software and be approximately 30 seconds in length. Deadline is October 15, 1999. Prizes include 3 x Amiga 1200 HDD Magic Paks and 25 copies of OS 3.5. More details are available on the Amiga website: http://www.amiga.de

Upcoming Amiga Shows

August 28-29: AmigaFest 99, the Amiga show within a show, is being organized as part of the Dayton Computerfest show at Hara Arena in Dayton, Ohio.

October 9-10: Amiga Extravaganza '99 is being held in Indianapolis, Indiana at 3912 West Minnesota Street.

Toast Master

This article has additional
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ChromaFX Tinting

By Bohuš Blahut

This issue we'll begin investigating probably the most misunderstood and under used part of the Video Toaster - ChromaFX. Unfortunately, NewTek has pretty much left it unchanged since the earliest version of the Toaster. This doesn't particularly bug me, as it is very powerful the way it is; but I can think of many ways it could be improved. I can only imagine what our third-party geniuses could do if NewTek had added ARexx control to ChromaFX.

Many users complain about the interface, claiming that it doesn't follow the Toaster's interface model. Actually, it follows the model quite well, it just requires a little bit more from the user to get good results.

Despite these complaints, I think that ChromaFX is one of the coolest parts of the Toaster. Even an old Toaster 2000 can do the same cool effects as a modern Toaster Flyer. ChromaFX has always been capable of doing some pretty twisted things. These stranger, often neglected, effects are finally seeing their day, now that trippy 70's visuals are making a comeback.

ChromaFX can do a lot more than garish psychedelia, and the sepia tone Old Film look you see often. Here, you will see how we can use ChromaFX for tasteful nostalgic tinting, color correction, and to make lovely sky and ocean filters.

This might be a good time to blow the dust off of your Toaster manual and peruse the details of how ChromaFX works, however we'll discuss a few significant points here. To make effective use of ChromaFX, you'll want a Preview monitor in addition to Main. The Preview display will allow you to see full color gradients even on a non-AGA Amiga. It isn't required, but it makes things easier.

If you don't have a second monitor, you can run the Toaster's Preview output to the CVBS (composite) input on many Amiga monitors - usually a yellow RCA jack. Depending on the model of monitor that you have, there may be a switch on the front or back to toggle between the various inputs. Multi-sync monitors, such as the Commodore 1950, 1960. and 1942, do not have composite video inputs.

The Toaster includes about 100 presets in ChromaFX, but many of these are too coarse for real-life use. They'll benefit from the tweaking which we'll be touching on in this tutorial.

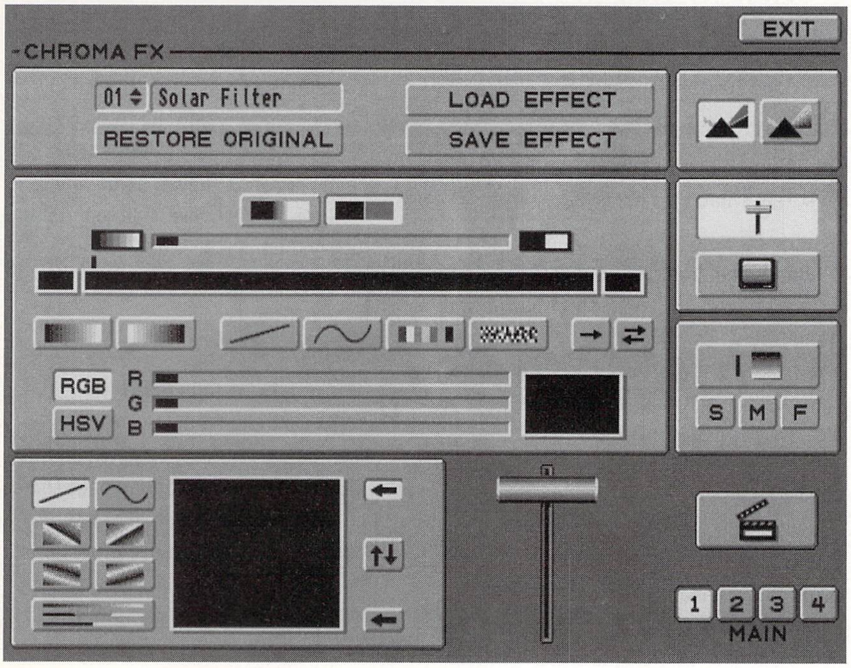
GETTING STARTED

The procedure for using ChromaFX is a little different in Toaster 3.5 than in 4.3, but the editing of effects is the same. In 3.5, go to the Setup panel, and you'll see the ChromaFX icon next to [Exit]. Click it to enter the editor. For the Flyer, select ChromaFX from the Programs pop-up menu, and you're there.

On your Amiga monitor, you'll see a number of controls; but the real work will happen on the Preview monitor, so make sure that's where you're looking. There you'll see the same controls, plus a few color gradients and color boxes.

The first thing that you'll probably notice is that there are very few textual labels and no number values on the interface. In fact, just about everything is a pictogram. This makes it difficult to set exact values for some settings, but it shouldn't be a problem here. You'll probably want to have the manual handy until you get used to the interface.

As with anything, to be really productive with ChromaFX, we should first understand what it does behind the scenes. ChromaFX examines the luminance of the incoming video signal (selectable by the mini-switcher in the bottom right corner), and splits it into 96 possible levels of brightness. This is a type of graph called a Luminance Map. ChromaFX allows you to add color enhancements to video based on these brightness levels.



The ChromaFX Editor

The long horizontal strip in the middle of the screen is called the Color Strip. This is where you set the colors that ChromaFX should apply to video based on the Luminance Map. In it's normal state, the Color Strip ranges from the darkest luminance values (left) to the lightest (right); in other words, normal video. Reversing the Color Strip, so that the gradient ranges from light to dark, means that ChromaFX is inverting the colors based on the Luminance Map - resulting in a photographic negative!

By changing the colors in the Color Strip, we can apply color to different portions of the image based on their brightness. Let's say that you have a video camera aimed at a card with a black stripe, a grey one, and a white one. When ChromaFX examines this picture, it splits it into three levels of luminance. If you were to create a Color Strip with blue in the middle, then ChromaFX would apply blue to only the grey bar. The black and white bars would be left unaffected.

This is a very simplified (controlled) example, since it's easy to determine what the middle of the luminance map is; but it's not as easy with live video. From that example, you might think that you could do something like changing the color of somebody's necktie, or colorize b/w footage - you can't. The mistake that a lot of people make is thinking that ChromaFX works with the black and white colors in a picture. It's important to realize that, while the Color Strip is black and white, it represents luminance levels, not color (grey scale) values.

In the lower left corner of the editor, is the Color Table. This is a multi-purpose indicator, and what you can do with it depends on a number of variables within ChromaFX. In our first tutorial, it will allow us to have two active Color Strips, and the T-bar will let us smoothly transition between them. The large box on the Color Table is a thumbnail representation of the full screen filter being created in ChromaFX. To the right side, you'll see an arrow pointing to the top of that box, and another pointing to the bottom. The arrow that is selected indicates which Color Strip you are editing. The top Color Strip is in effect when the T-bar is at the top, the bottom Strip is in action when the T-bar is at the bottom. You can also leave the T-bar somewhere in the middle, for a mix of the two Color Strips. To the left side of the box, are various buttons that control the way the effect transitions from top to bottom.

NEGATIVE

To illustrate this principle, let's create a ChromaFX preset that starts with normal video, then becomes negative as you pull the T-bar down. You'll want to have some long running video footage playing into Input 1, while we play.

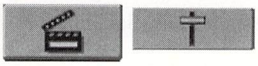
01 Solar Filter

1. In 3.5, you must first choose an effect from the upper left hand list to overwrite (don't worry, you can get it back later). In 4.2, don't worry about this step.

2. In the Color Table, select the [Vertical Spread] gradient type.

3. Click [Top Line] in the Color Table; then click [Normal Video] in the Color Strip section. This will set our effect to have normal (unchanged) video when the T-bar is positioned at the top.

4. Click [Bottom Line], and click the Color Strip [Negative Video] button. This configures the effect to show a negative image when the T-bar is at the bottom.



5. Click the [Clapboard] button to render the effect. Make sure that the Filter Position is set to [Transition] and then pull the T-bar down slowly. See how it's gradually changing the video to negative? Pretty cool, huh?

BLUE TINT

I'm not sure when you would need to partially make video negative; but there are plenty of times when you want to add a colored tint to video - especially black and white footage - or footage that you make black and white through ChromaFX. If you ever make slideshow type retrospective videos, how about using a suite of different colored tints from picture to picture?

Continue along as we create a very versatile ChromaFX effect that adds a blue tint to video.

6. In the Chroma Control panel (upper right corner), select the [Black-and-White] video button. This instructs ChromaFX to convert the video to black and white before further processing it. This is really desirable when creating a tinting effect like this one. The effect of the tint is more deliberate when added on top of b/w video than on top of color.

RGB

7. With [Bottom Line] already selected in the Color Table, select the [RGB] color mode in the Color Strip panel.

8. Now, we want to create a blue gradient that goes from a dark blue to a light blue. On the Color Strip, click on the box to the far right (it should be colored as white right now). This moves the cursor to the rightmost position. Think of this box as a magnifying glass onto the color change that's applied to the lightest part of the video - hence it's name, the Lightest Box.

The R,G and B color sliders range from 0 to 255. Set R to 0, G to 0 and B to 255.

Now, on the far left, click on the [Darkest Box] and set R to 0, G to 0 and B to around 25.

9. To create a smooth blend between the Dark and Light blues, select [Horizontal Spread] and then click on the [Lightest Box].

10. That's it! Render it and drag the T-bar to set whatever blue level you like.

Note, if you drag the T-bar without clicking the [Clapboard] first, the Toaster will pause for a few moments to render the effect. Now you've got a preset that makes your video black and white, then adds a blue tint to whatever degree you choose.

CONTRAST

When I convert video to black and white, I usually like to add a little more contrast than the usual gradient spread in ChromaFX, so here's how to tweak the above effect a little to get better contrast. I'd also recommend going through some of your ChromaFX favorites and adjusting them in this same way.

Restoring ChromaFX Presets

When you exit the ChromaFX editor, it saves the changes you have made to the currently selected preset. If you want to restore the original setting of the current effect, you can just click [Restore Original].

There's a fast way to restore all the presets at once: In the TOASTER: Programs/chromafx_support/ directory you will find two files: "chromafx.default" (the original presets) and "chromafx.effects" (your edited effects). If you copy chromafx.default over chromafx.effects, the next time you start the ChromaFX editor, all the original presets will have returned.

11. Click on the [Darkest Box] again, and then select [Copy]. The next time you click on the Color Strip, it will copy the selected color to the place you clicked. Click in the Color Strip an inch or so from the left. Now your darkest blue is copied a little further up the Luminance Map.

12. While the blue is selected, we need to fix up the gradient. Note the position that is currently selected on the Color Strip; we want to go back there in the next step. Select [Horizontal Spread], then click the [Lightest Box].

13. Click on the [Darkest Box] and set R, G, and B all to 0 (black). Select [Horizontal Spread] and click the dark blue (the position I just told you to remember). This makes a spread from black to dark blue. Render the effect and play. Ahh, beloved contrast!

We could have created this tinting effect with a single Color Strip; but then we wouldn't have had the versatility of it being adjustable.

If you come up with a preset that you like, and think you might want to use it again later, just click [Save Effect] and give it a name. Use [Load Effect] to reload it later. By doing so, you can re-use the same ChromaFX effect in multiple projects. Visit this issue's online bonus section for downloads of some of my ChromaFX effects to see how adaptable this technique is.

Whether it's slick or psychedelic, I really love ChromaFX - and I guess it shows. I hope that you'll look forward to more ChromaFX fun in future issues of NewTekniques.

Bohus Blahut is the director of The Vantage Point and creator of the Catalyzer tutorial video series. You can email him at bohus@xnet.com

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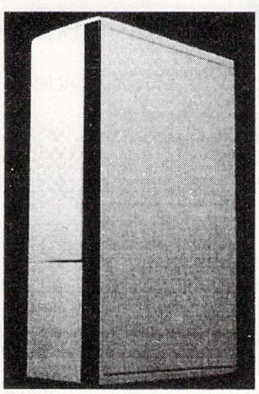

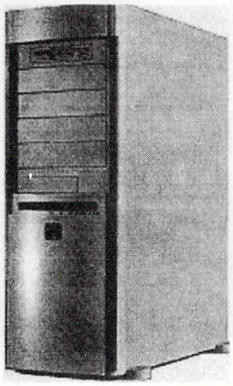

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Flying High

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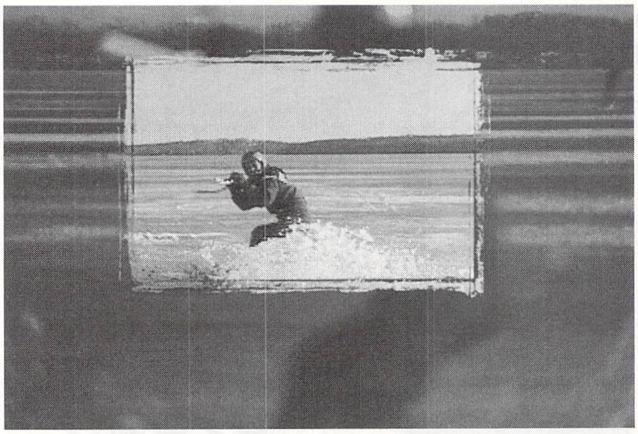
By BOHUŠ BLAHUT

EXTREME PIP!

Compositing on the Edge



Stylized custom picture-in-picture effects can really spice up a project!

I recently did a spot for an Extreme Sports television show out of California. Segments feature information about the sport, some grandstanding, and a music video. The segment I cut is on kite skiing, and since I was out to win future jobs, I pulled out all the stops over the three day edit. I used a DraCo to edit, since it is such a mighty compositor - and it's hard to watch television productions today that don't have lots of layers and action.

Moving picture-in-picture effects add some excitement to transitions.

Once the dust had settled, I wondered how to recreate some of the effects I did, using the Flyer. Part of the challenge is in finding the inspiration for high-end effects. You may not have realized that LightWave 3D is a very powerful and versatile engine for fine graphics. We've used it for print work, text CG's, and of course compositing. If you watch television with a critical eye, you'll soon see that compositing is a skill that you'll need to pick up if you want your video to look slick and resemble broadcast television.

The other challenge is that compositing video is not one of the Flyer's strong suits, by any means. This has opened up the market for several third party applications to create awesome compositing tools. The superlative ImageFX (and it's alternate front end VisualFX) is my favorite tool, while Composite Studio is a great compositing engine as well. However, there are plenty of great tools within the standard Flyer suite that will can make the magic happen, too.

"Compositing" means combining various elements into something new. When you were a kid and pasted pictures out of magazines together for a school project, that was a type of compositing (the French call it collage). On the Toaster, when you create a Key page in ToasterCG, or paste down a brush in ToasterPaint, you're compositing.

Many of you have used third party software to create the workhorse of the compositing world: the picture-in-picture effect (often called PIP). There are plenty of projects where using a simple PIP is the best choice; but these days even the most conservative shows have soft-edged PIPs, moving graphic elements in lower third boxes, and lots of layers.

Personally, I like complex compositing. I like lots of layers that create a texture out of the usually flat landscape of video. I like lots of layered video going at different speeds, heavy colorization, soft or ragged edges on scaled down video, glowing, etc.

The effect that I'm going to show you is one that I used in the sports video. It acted as a bookend to go from a section of interviews to the music video. The interviews were mostly straight cut, while the music video was very graphic intensive. This served to bridge the two segments, bringing a sense of continuity to the piece.

Let's get cracking on the composite. We'll be creating a rather nice PIP effect, more sophisticated than what you see in most Flyer productions. First we will create a video clip that is soaked in blue, and runs in slow motion. This will be our background. Then we'll center the foreground image, and add a nice ragged edge to the composited video.

There are many steps here, but they're quite simple. We'll be using LightWave, but don't let that spook you. Actually, this effect is so simple, that it also serves as a very nice introduction to LightWave.

I've prepared an archive of support files to go along with this tutorial. You can get it from the Downloads section of this issue's online bonus area. This archive is not necessary to complete the tutorial.

PREPARING THE BACKGROUND

We'll be adding a soaked blue effect using ChromaFX while we're digitizing into the Flyer - that's one less thing to render. Locate some footage that you want to use as a background.

1. From the Project/Switcher view, select the Main input that has your footage. Go to the Project/Files view and click [Record...]. First, we want to record the foreground video. You can use whatever footage you want, but only record about 20 seconds for this tutorial. You'll need Source set to whatever input you are using. When you're done, save this clip as "foreground".

2. Find a ChromaFX effect to add some excitement to this next video clip. You can use the one I created for this tutorial, "Bohus_blue", or there's a lot more in the Effects/ChromaFX directory.

Double click on the ChromaFX crouton and your Main out should show the ChromaFX effect affecting the incoming video.

This time, before you start recording, change the Source to [Main Out]. This is a really cool feature of the Flyer. Instead of the incoming video going straight onto a Flyer drive, it passes through the Toaster first - which means that your clip is recorded with the ChromaFX applied.

[Record...] about 10 seconds, and trim to taste.

3. I often like to run backgrounds in slow motion. So, select "flyerproc" from the [Tools] pop-up. Flyerproc lets you perform a number of cut & paste type operations on your video footage. When it asks you, select the clip you just recorded. Call it "background". At this point, you can use the slider bars to choose any part of the clip to be affected by this operation. We want about 10 seconds.

4. The next dialog box asks what effect you'd like to perform on the clip - choose Slow Motion.

Slow Motion duplicates frames in your clip, so the next decision that you have to make is how many frames flyerproc will create. A Speed setting of 2 will double the frames, thereby doubling the length of your clip. 3 will triple it, and so on. Try a value of 2 for this project.

Now, flyerproc will ask you if you're sure you want to continue. This is a good time to mention that flyerproc gives you the opportunity to select other clips for other effects. This is called batch processing, and it allows the computer to render out several projects, one after the other. This lets you pick several clips that you want to add flyerproc effects to and render them overnight.

We only want to process this one clip, so click [Cancel] and then [Continue]. Now go get a sandwich, Slow Motion will take awhile depending on the length of the clip and the speed of your machine.

Bingo! Now you've got a background that's ready to go. I often use this type of background as-is behind text. It helps CG text really stand out. The footage that looks best with this effect usually has a lot of contrast in it already, and perhaps a little camera movement. It also smooths out hand-held shots.

MAKING THE SCREEN

Now we go to LightWave to do some compositing. We'll be loading the slow motion footage as a background picture and applying the foreground video to a simple LightWave object. By adding a transparency image to our foreground object, we'll easily be able to give the PIP a really cool looking ragged edge.

5. Select LightWave from the [Programs] pop-up. It makes no difference which version of LightWave you use, just so long as it can load Flyer Clips. I used version 5.

Click [Modeler] in the upper right. This is where we'll build the screen object that we'll need. Select [Box] under the Create menu at the left side. Then press [n] to bring up the Box settings panel. This panel lets you input numbers for precise box making. Enter these values:

Low	High
X: 752 mm	X: 0 mm
Y: 480 mm	Y: 0 mm
Z: 0 mm	Z: 0 mm

Leave the Segments values all at 1. Click [OK] and press [Return] to Make the box.

6. To name this object's surface, press [q]. The Surface is currently named "default". Delete that, and type "screen_surface". Click [Apply]

7. [Save As] the object with the name "screen". I use this screen object a lot, so it's stored in the root of my objects folder, along with the "nullobject".

8. We're done here. In the upper right, click [Layout]. Back in Layout, hold the shift key and click [Modeler]. This will free Modeler from memory.

Cool! We've come out of Modeler one box richer.

ASSEMBLING THE PARTS

Now we'll put all of the elements together. We'll load the FlyerClips into a LightWave scene and add a transparency mask to give our PIP a little pipzazz!

9. Across the top of the screen, you'll see the buttons that open up the various control panels in LightWave. Click [Images]. Here we'll load all the parts that we're going to assemble into our final video clip.

Click [Load Flyer Clip] and select the "background" clip we made earlier. Click [Load Flyer Clip] again, and select the "foreground" clip that you recorded earlier.

10. We need one more thing... an alpha image that will control the transparency of the screen object that we just created. If you didn't download the tutorial archive, you should skip this step, as well as step 15.

Click on "Load Image" and select the "raggy_edge_alpha.iff".

11. We've got all our parts loaded now, so click [Continue].

12. Click [Objects] to bring up the Objects Panel. Click [Load Object] and select the "screen" object that we made earlier. Click [Continue].

13. Under the Edit menu, select [Objects]. Press [Return] twice to lock (keyframe) the screen object in place.

If you're familiar with LightWave, you may also want to reposition the screen object, set up an animation path, etc.

14. Click [Surfaces]. The Current Surface should be "screen_surface", if it's not, select it.

Click [T] next to Surface Color to set the Color Texture. Make sure that Texture Type is set to "Planar Image Map", then set Texture Image to "foreground (clip)" and Texture Axis to [Z Axis]. Click [Automatic Sizing] and [Yes]. Then click [Use Texture] to get back to the Surfaces Panel.

15. If you skipped step 10, also skip this step.

Click on [T] next to Transparency. Confirm that Texture Type is set to "Planar Image Map".

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Set Texture Image to "raggy_edge_alpha.iff", and Texture Axis to [Z Axis]. Click [Automatic Sizing] and [Yes]. Then click [Use Texture].

16. Whew! We're done with the Surfaces Panel, click [Continue].

17. Go to the [Effects] Panel and select the [Compositing] tab (this varies in other versions of Lightwave). Set Background Image to "background (clip)" and click [Continue].

FINAL RENDERING

Now we're almost ready to render. A few final settings and were off.

18. On the [Camera] Panel, enable [Field Rendering]. There are settings for anti-aliasing and motion blur, but we don't need those this time. Click [Continue].

19. On the [Record] panel, set the Animation Type to "FlyerClip". Click [Save Animation], select a Flyer drive and name the final clip.

20. That's it! [Save Scene] somewhere safe on your hard drive. Also, go to [Objects] and click [Save All Objects] so the object surfacing changes we made will be saved.

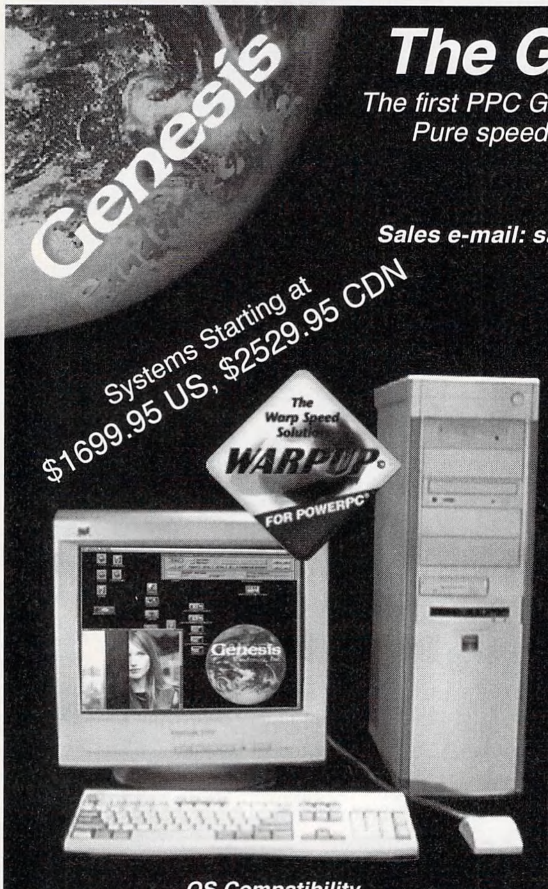
21. Click [Render]. Select [Automatic] Frame Advance. For our 20 second test video, set First Frame to 1, Last Frame to 600 and Frame Step to 1. Click [Okay] and go watch a movie... This is going to take awhile.

This may seem like a lot of work and the render will take awhile, but the results are worth it. It's easy to become spoiled by the Flyer's speed and immediacy, but it's wise (and profitable) to sprinkle a few of these rendered and slick effects throughout your productions.

Perhaps use it as a graphical bumper? This way you can render the sequence once, and just key a different CG over it each time. How about covering an edit where you've run out of footage to show? Fancy graphics can often gain you a few seconds in the editing room. The list goes on and on.

If you're interested in seeing the television show that I created this for, check out www.adrenalinetv.net for listings. Things are looking good for the show to get picked up for syndication nationwide, and we'll be creating more segments for it here at The Vantage Point. The Flyer will undoubtedly become an integral part of that production, and I'm sure that it'll help me keep wowing those Avid guys!

Bohuš Blahut is the director of The Vantage Point and creator of the Catalyzer tutorial video series. You can email him at bohus@xnet.com



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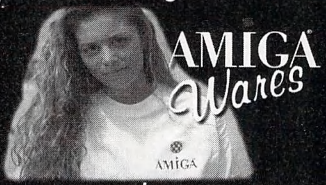

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VIDEO
MILLENNIUM
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Millennium is Coming...

The Long Awaited Amiga Toaster/Flyer Upgrade

By now, you've probably heard the whispering. Millennium is said to hold surprises and major changes for many of us. It's been a big secret for awhile, but the truth is finally out in the open. It's going to be far more momentous than you might have believed.

What we're talking about, of course, is a long awaited upgrade for the Amiga Video Toaster and Flyer. It's called Millennium, and it is probably the biggest upgrade for Toaster and Flyer users in years.

A Brief History

Before we start spilling the beans and telling you the details of the Millennium package, let's go back a few years to a developers meeting at NewTek headquarters. Here is where the discussion began about NewTek putting together a major Toaster/Flyer upgrade, involving third-party developers and including as much content as possible. The idea was good, but nothing really came of it until the 1999 San Diego Toaster Symposium; where late one night, the topic came up again. Those present began spurring Tim Jenison to make it happen. Suffice it to say that Tim was convinced, and the project began.

Compatibility

Several guidelines were put in place to insure that Millennium covered the most ground possible. The main rule was that the package must be as useful to a Toaster user, as it would be for those who also have a Flyer. This meant Toaster specific tools and effects, and compatibility for Switcher 3.x and 4.x. While every Toaster owner should have a Flyer, those that don't will still find a lot of cool stuff in Millennium.

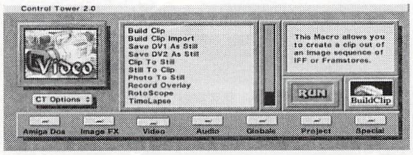
Old Becomes New Again

Included in Millennium are numerous great products that are no longer available or never made it to market, but will still provide valuable additions to the Toaster/Flyer toolkit.

One of the first products added to Millennium was Byrd's Eye Software's Swipes! Toaster effects. These were never readily available to Flyer owners, since they went off the market before the Flyer was released.

Similarly, Matrix Production's Prowipes had been taken out of production. Both products also had many unreleased effects intended for future volumes that were never realized. Millennium has them all.

Also gathered were various collections of backgrounds, fonts, animations and video sequences. In some cases, developers have been encouraged to re-release those products and provide samples in Millennium. In other cases, such as with Digital Motions, Millennium contains entire sets. This means more content for Millennium and more products back on the market.

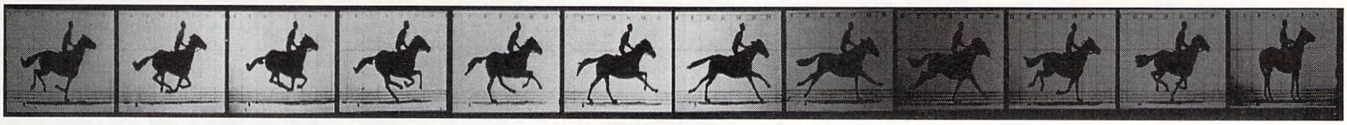


This Macro allows you to create a clip out of an image sequence of IFF or Framstores.

Should Have Beens

There are a lot of great products available that should have been in the basic Toaster/Flyer toolkit from the beginning. To remedy that, many are included with Millennium, such as Wipe Studio, RenderFX and Promix.

ImageFX4- Now with Animation!



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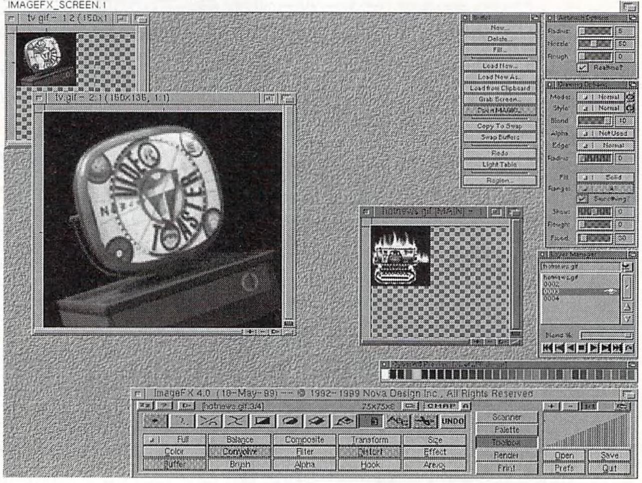
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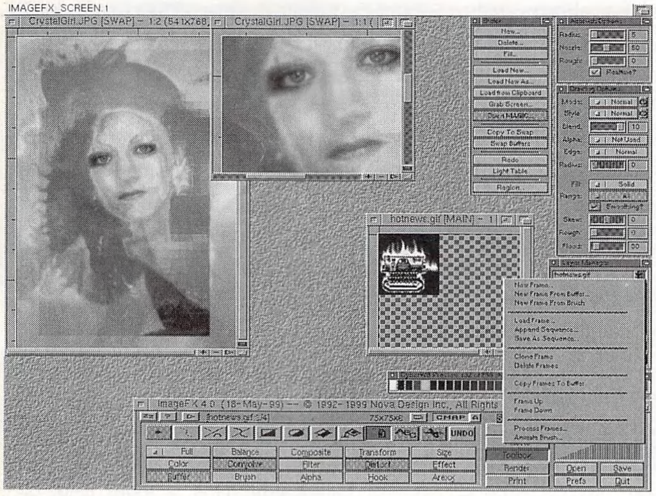
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As of this release a new price structure is being implemented for upgrades. ImageFX new is only $349.95. If you own a version of ImageFX prior to version 2.0 your upgrade price is $149.95. ImageFX 2.x owners can upgrade for only $99.95. ImageFX 3.x owners can upgrade to ImageFX 4 for only $79.95. All upgrades include the necessary documentation or upgrade documentation and CDROM.

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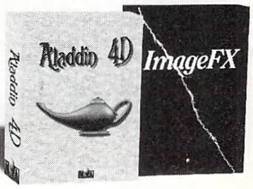
Aladdin 4D
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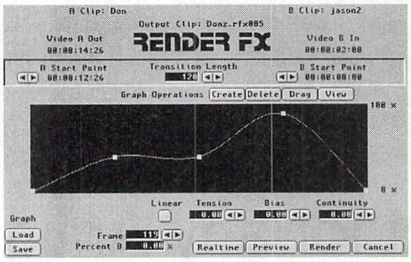
Circle # 207

It's important to realize that these are not stripped down or lite versions. In some circumstances, programs have also been updated to give better performance and new functionality.

Wipe Studio is essential for those times when you just have to have a custom wipe effect. It is the only software package available that allows you to create 4.0 style wipes (it also creates 3.x style). Matte, color and overlay wipes can all be created with a little work and imagination. Additional utilities to aid in the wipe making process have been added as well; for example, adding transparency to color wipes is now only a click away.

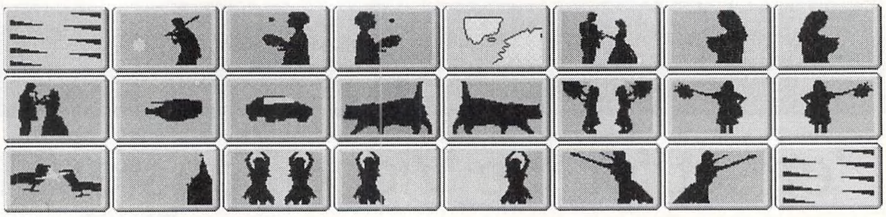

A Clip: Don
B Clip: jason2
Output Clip: Donz.rfx005
Video A Out 00:00:14:26
Video B In 00:00:02:00
A Start Point 00:00:12:26
Transition Length 120
B Start Point 00:00:00:00
Tension 0.00
Bias 0.00
Continuity 0.00
Frame 119
Percent B 0.00 %

RenderFX allows you to render an entire project down to a single clip. At a very basic level. this is handy for archiving completed projects. More valuable, though, is the ability to layer CG effects, and perform other functions that Flyer limitations make impossible. Support has also been added for ChromaFX effects, which makes this tool even more powerful than ever before.

Promix provides a fantastic set of sound tools that add much needed sound editing capability to the Flyer. Full audio mix-downs and audio inserts on either single or stereo channels are now available with the ease of a pull-down menu. StealAudio lets you take the audio from any Toaster Effect and use it as a Flyer audio clip. ShiftAudio allows you to adjust audio synchronization with a video clip to get that perfect lipsync.

Lots of New Content

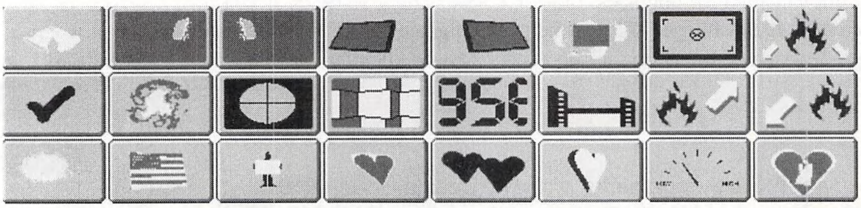
In addition to previously existing products, Millennium adds new content too, including over a hundred completely new wipes. Added to the Swipes! and Prowipes collections, previously mentioned, this gives Millennium a collection of over 200 wipes. These range from basic animated and gradient wipes to fully rotoscoped motion matte wipes. All these wipes are available for either 3.x or 4.x systems.


A collection of over 200 wipes for either 3.x or 4.x systems.

Also included are new fonts and background graphics for use in ToasterCG and other applications.

There are some exciting new software utilities, too. Most Flyer users already know how difficult it can be to backup projects. To improve on this, new scripts are included that allow backup directly to a hard drive or removable media drive. You will also be able to do basic video deck control directly from the Flyer interface - including support for many professional recorders and players.

There are some other nice utilities, but one of the most exciting has to be Electric Scene Knife. Currently, after you've recorded footage on camera, you then transfer it to FlyerClips by carefully recording each scene to the Flyer separately, or recording everything as one large clip and then breaking it up into smaller clips manually. That can take a lot of time, and it is often a very tedious and boring job. The advantage of the Knife is that it can automatically detect scene changes in a FlyerClip. After scanning your clip, it shows you the positions of all the scene changes, each with their own croutons. Then you just tell it what scenes to separate, and it will split those scenes into their own clips. With much less effort, you're ready to start editing.



A Benefit to Developers

Another important area that needed to be improved on was the programmability of the system. To address that, Millennium adds the vifly.library, from Visual Inspirations, which adds over 300 new ARexx commands for the Toaster and Flyer. Among other things, it allows you to add pull-down menus and menu dialogs. Now that this will be included in Millennium, developers can count on having a richer ARexx command set for Toaster and Flyer development. It's also presents an easy way for the advanced user to be able to put tools of their own, directly into the Toaster/Flyer interface.

In addition, a programmers manual for the all the Promix and RenderFX tools is included for the first time anywhere. So, anyone wanting to roll there own ARexx scripts using these tools, will have all the information they need to do it.

What You Get

Over a dozen companies were involved in the development, production and organization of Millennium. This includes a lot of people whose names you are sure to recognize: Kermit Woodall, Bill Evans, Bohus Blahut, Paul Lara and many more. With that kind of talent involved, it's sure to be a high quality package.

The resulting product will include three CDROMs filled with wipes, fonts, backgrounds, software and more; full documentation, professionally printed and designed to integrate into your current Toaster/Flyer manual; a video tape overview of the Millennium package; and a comprehensive, full-color catalog of other Toaster/Flyer products.

Millennium is expected to ship later this year, the price is not yet known.

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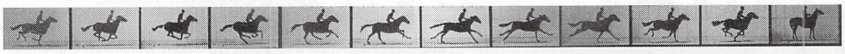
Review

IMAGEFX 4

BY CECILIA AND DHOMAS TRENN



Many years ago, the definitive "paint" program was DPaint. It is limited in many ways compared to today's software, but it has some great features that ImageFX and other programs are just getting around to adding. In particular, is DPaint's ability to page-flip through a sequence of images.

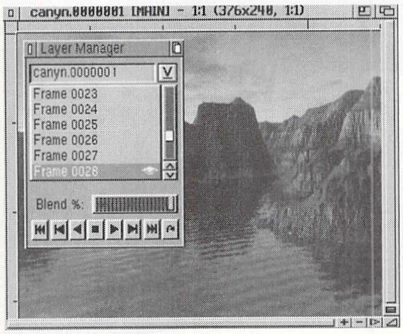
An artist doesn't want to waste time fighting with tools or being frustrated by some obscure programming concept. They need immediate feedback. That's why a #2 pencil, or even a piece of charcoal, may still be the best artist tool. There is no more immediate feedback than the one you get from feeling the line appear under your hand. Computers are wonderful and can help make the creative process a greater experience; but sometimes programmers get so caught up in the process of coding, they forget that brains trained in hand-eye coordination, need tools that emulate that experience.

ImageFX 3, introduced layers - a sophisticated way to organize and composite several image elements. The compositing and blending that can be achieved quickly with layers, satisfies that immediate feedback need. Now we can composite, see how it looks, and change our minds without hassle. Artists operate in a constant state of undo - we can't create without changing our minds. The addition of layers was magnificent, but the job wasn't done yet. That itch to easily view an image sequence was still there. We need to see images move - ideally, while we're working on a scene, not after we've taken several additional steps using external programs to view the results.

Although we didn't know it then, the addition of layers was laying the foundation for something even more wonderful to be added later - we just had to wait. Finally, the long wait is over, ImageFX 4 is now shipping, and the big news about this version is... animation.

WHAT'S NEW

Animation



Built onto the existing layers system, the new animation support allows you to manipulate and page-flip through multiple frames, and see the results immediately within ImageFX. For big projects, this requires a lot of RAM, so the more you have the better - of course, you can still use the built-in virtual memory system. It's important to understand that a buffer can only be using layers or animation - not both at the same time. It's not as confusing or limiting as you might think. You can have multiple buffers in different modes and even Drag and Drop images to and from buffers. An animation, however, will insist that images are all the same size.

Loading and saving of GIF, ANIM and FlyerClip animation formats is directly supported. You can also load sequences of numbered images, and indicate the range of frames to load. When saving a sequence, you can set the starting frame number. This is good stuff if you are working on a large project and want to break it up into smaller parts, or need to replace a particular range of frames. Saving a series of frames as an animation, is as easy as clicking save, and selecting a format.

Most effects can be applied to an animation, either in it's entirety or by selecting a range of frames. You'll be warned that there is no undo. This would require a lot of memory and is only slightly annoying. The Light Table mode can also be used; allowing you to see through to the previous frame.

A really great feature, is the ability to process frames using AutoFX scripts.

Blob

This effect is strange, creating something that looks like paint oozing down the surface of your image. You are given control of 28 parameters; including animation, randomness, positioning, shape, shading, color/palette, and texture. With those, you can create a sort of lumpy, dripping, colored substance.

Distorter

Distorter is similar to Perspective 3D Rotate without the Z-Axis control, but with a twist-ability instead. Like other ImageFX effects, you get a moveable grid overlay on your image buffer. Using that grid, or equivalent sliders in the parameter window, you

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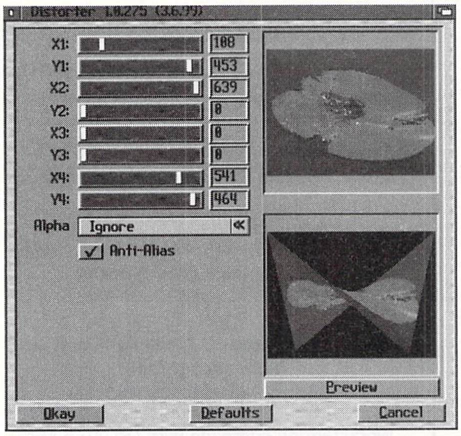


Distorter 1.0.275 (3.6.99)

X1: 100
Y1: 453
X2: 639
Y2: 0
X3: 0
Y3: 0
X4: 541
Y4: 464
Alpha: Ignore
☑ Anti-Alias

can distort your image by dragging each of four corners around in 2D space. More interesting though, is the ability to squish and twist images.

A sort of page flipping could be done, taking advantage of the ability to create a distorted alpha channel for use with compositing. This could make for an interesting wipe effect.

Fireworks

Fireworks is exactly what you think it is - well, that, plus more. It's a particle system where you can set the number of particles, affect them with gravity, air resistance, burn rate, and so on - 18 parameters in all, including options for color, draw mode, blend, size, angles and trails.

The particle system can also be used with brushes, which will move according to the rules you've laid down for the particles. With some good planning, you might be able to create an interesting flying effect using this.

ARexx

As you would hope, ARexx support is included for all the new hooks and features.

WHAT'S CHANGED

Text Generator

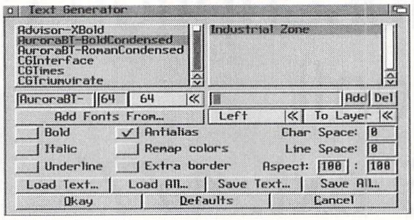
The Text hook has been updated with some new features. The best of which is a preview display that is overlaid on your image buffer. This is very handy for making adjustments to your text style, color and size. Now you don't have to leave the hook until you have everything tweaked just right.

Instead of the Amiga's built-in font requester, you now get a small ListView of font names. If you've got hundreds of fonts, you'll miss the old font selection method. Font directories can now be chosen, which is a nice bonus. Also, there is support for postscript fonts via the hwgpost.library; but the freeware libraries discussed last issue, are a better alternative.

New Char and Line Space parameters are handy, providing a means to increase or decrease the space between characters and lines of text. You can also scale text in the X and/or Y directions, for example, to make it double width. But, this feature is implemented in a very awkward, counter-intuitive way. Last of all, text can now be rendered into a layer as well as a brush.

This new Text hook has good intentions; but the bugs aren't all worked out yet. Beware!

You should also know that the internals of rendering text has changed. Text is now generated as an alpha channel, with the RGB channels carrying only the color information. The benefit of this method is that antialiasing is improved; but now effects like Blur, won't work on a brush as you would expect.



Text Generator

Advisor-XBold
AuroraBT-BoldCondensed
AuroraBT-RomanCondensed
CGInterface
CGTimes
CGTriumvirate

Industrial Zone

AuroraBT- 64 64
Left
To Layer
☐ Bold
☑ Antialias
☐ Italic
☐ Remap colors
☐ Underline
☐ Extra border
Char Space: 0
Line Space: 0
Aspect: 100 : 100

Lens Flare

There's been a few additions to Lens Flare; including Rotation, Offset, improved antialiasing, and better Anamorphic stretch. Two new light types have been added as well.

Other

There's also a lot of other minor tweaks and bug fixes in this version. Plus some added time-saving features, such as the ability to multi-select files when loading.

Flyer Support

Although you can now load FlyerClips as animations, it's a very time consuming process, and given the size of most clips , it would require a huge amount of memory. Virtual memory can be used, but it would slow the process down even more.

You'll be okay with small clips; but I think with regard to the Flyer, ImageFX remains most useful as a frame-by-frame batch images processor.

WISHES

The macro recorder does not record layer or animation commands. This is a downer for those of you who aren't quite up to creating your own ARexx scripts. You'll have to add those commands in manually.

One of the most obvious, yet missing, features in the animation system is the ability to set the rate of playback. It's understandable that with no real limitations on image size, that it couldn't be an accurate frames per second function. But, being able to adjust the speed is absolutely necessary, particularly to slow down small resolution animations, that currently will play too fast.

DPaint has a feature that desperately needs to be added to ImageFX - the ability to zoom and pan while picking up a brush. Other functions, such as cropping would also benefit from this ability. This is essential to do pixel accurate work.

CONCLUSIONS

Nova Design has done a great job on this release. It's likely more stable than any previous version. There are still some bugs to be worked out, and assuredly more will turn up when the public gets their hands on it. There's also still some room for improvements on the new features. However, Nova Design is great with releasing free updates, and they are already aware of all the concerns addressed here.

ImageFX continues to become more and more powerful, and grows closer to being the ideal artist's tool.

ImageFX 4 sells for US$349.95 and is available from Software Hut and Safe Harbor Computers. Special upgrade pricing is available from Nova Design.

Continued from page 19

Close the requestor and Make a KeyFrame [Return Return] at frame 0 for the Camera. Your display should match Figure 5. Now, would also be a good time to save the scene.

Since we are going to be leaving the camera in the same place for the entire shot, we need to add something to keep the viewer's attention; so, let's add some movement to the UFO. This is where the spinner objects will come into play. Their movement, along with the movement of the UFO, will help give the shot some excitement. We'll start with "BaseSpinner.lwo".

8. Change to Object Mode [shift-o] and select "BaseSpinner.lwo" from the [Selected Item] pop-up on the bottom of the Layout window. We want this spinner to be, well, spinning of course.

Enter the following values at the indicated Key Frames:

Frame: 0
Heading: -36.0
Pitch: 0.0
Bank: 0.0

Frame: 360
Heading: 36.0
Pitch: 0.0
Bank: 0.0

Note: You can jump to any frame you like by pressing the [f] key and entering the desired frame number.

9. The two top spinners will have similar rotations. However, since there are two of them, we want to make them rotate in opposite directions.

This way they will blend with each other as they rotate around. Since we want them to come together at a given interval, as seen through the edge cutouts, we need to start them both at the same place. We also need to make sure they both rotate at the same speed. We accomplish this with the following settings:

"GREENSpinner.lwo"
Frame: 0
Heading: -15.00
Pitch: 0.00
Bank: 0.00

Frame: 360
Heading: 45.00
Pitch: 0.00
Bank: 0.00

"REDSpinner.lwo"
Frame: 0
Heading: 15.00
Pitch: 0.00
Bank: 0.00

Frame: 360
Heading: -45.00
Pitch: 0.00
Bank : 0.00

10. The last thing we need to do for the UFO motion, is to add a little upward movement to the craft. Since it is going to be taking the unfortunate motorist back to the Relnek Nebula for some probing in delicate areas, it may as well get a jump on the journey. Add the following key frame for **"TowTruck_UFO.lwo":**

Frame 240
X: 1 m
Y: 2.5 m
Z: 0.0 m
Heading: -12.00
Pitch: 0.00
Bank: 0.00

We only need to add one key frame for the UFO, because it will be following a linear path upwards from the beginning of the shot till the end. Other elements of the scene will make this rather dull movement work out just fine. Also, the slower the UFO moves, the more apparent scale it has and the larger it will feel on screen. Ultimately having a vehicle below it for reference, doesn't hurt either.

11. Let's make a preview to see how everything is shaping up. Before you start, change the Last Frame field in the lower right to 240.

This will set the default preview length to 240 frames, and since that's how long our shot will be, it's a good thing. We can make a wireframe preview by selecting the [Preview] pop-up menu and highlighting [Make Preview]. Select [Wireframe] and click [OK]. After a few moments of building, you should be given the transport controls for the preview. Leave the default frame rate at 30 and press Play to see what we have created thus far.

Now would be a good time to save your scene again.

Note: Depending on the memory configuration on your machine, it may not be possible for you to make a full preview from start to finish. In that case, you should select a range that is playable or change the [Frame Step] from 1 to 2 or 3.

Now that we have our objects doing something of interest, let's turn our attention to the surfacing. By this time, you should be familiar with the inner workings of the Surfaces Panel, I will only be discussing the newer elements that will be needed and leave the rest to your most capable understanding.

12. The surfaces you need to load are included in the downloadable tutorial archive. They are named according to which surface they need to be applied to. So, if you followed the naming conventions we have been using thus far, everything will fall right into place. If you have not been naming things as suggested, then shame, shame.

You may notice that when you load in some of the surfaces you get an error message. If that happens, it is because you do not have the interfere.p plug-in loaded. This was a plug-in supplied by NewTek as part of the free 5.6 upgrade. If you have an earlier version of LightWave and cannot take advantage of interfere.p, follow along anyway. Once you have loaded the surfaces, and re-saved the objects, the error messages will go away. See the sidebar interfere.p for an explanation of what you are missing.

Once you have loaded in all the surface data, make sure you save all your objects to update all those details on disk. It can be very frustrating to have to redo something, because you forgot to save the objects.

In addition to the surfaces with LW_ThinFilm on them, there is something else to note. On "TowTruckUFO_Body", you may notice that the Glow Effect has been increased from 0 to 25%. This seems a little odd since this is the main hull of our UFO. On surfaces like "TowTruckUFO_HoldOpening" we would expect to see a glow added, since these are areas where light is coming from. There is, however, another use for Glow Effect, and having the ability to set different glow amount values for each surface makes it all possible.

By selecting a smaller portion of the overall glow assigned to a scene, you are able to create a sort of diffused light around the entire UFO. Furthermore, since we are not making the surface of the UFO luminous, those areas with more light on them will get more glow effect. Thus we have created a poor man's Specular Bloom meets Light Diffusion. It is certainly not the perfect solution, but it does help by adding some mood to the overall image.

13. Since we have some surfaces with Glow Effect on them, we need to go to the Effects Panel and Enable Glow Effect with the following settings:

Glow Intensity: 75%
Glow Radius: 30.0 pixels

If we render [F9] a frame now, it should look like Figure 7.

We've still got a ways to go yet, but you can now start to see the shot taking form

You can see two things in this render. The first, is that the Glow Effect alone is not going to give us the look we want. It is not making the areas of the ship we want to be hot and bright quite hot enough. We will remedy that shortly. The second thing to notice is the hold opening in the center of the UFO. There, you can really see the color shifting created by the LW_Thin Film plug-in.

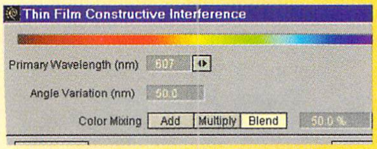
14. Before we fix the effectiveness of the Glow Effect, lets take the whole shot one more step closer to completion, by changing the Background Image in the Effects Panel to the "Mountains_Night.iff" image.

One of the many cool things about LightWave is that there are certain interrelationships between some settings that, if you get to know them, you can create some very cool effects. Things that wouldn't be possible with either setting alone. One example of this is with Lens Flares and Glow Effect. It is possible to use lens flares to overdrive a glow, without having to increase the Glow Amount.

I am about to provide you with the lighting scheme for this shot. What I don't want you to do is just load it in and continue with the rest of the tutorial. That would not be learning anything, and since we are here to learn, take the time to examine the lighting setup. Notice where the lights are placed, and what effect they have on the scene as a whole. A great way to examine a lighting setup, is to turn some lights off or increase there intensity so you can more clearly see what effect they are having on the image.

interfere.p

One of the many nifty new plug-in toys that was supplied by NewTek with the 5.6 upgrade, was a cool little tool called interfere.p. It was, in fact, several separate plug-ins when loaded, one of them being LW_THINFILM (Figure 6). What this plug-in allows you to do is alter the color of your surface with respect to its angle to the camera.


Thin Film Constructive Interference

Primary Wavelength (nm): 607
Angle Variation (nm): 50.0
Color Mixing: Add | Multiply | Blend — 50.0 %

Figure 6

The first step in the process is to select a color value that you would like your surface to change to. This can be done in two ways. The most intuitive way is by selecting the color you desire from the Rainbow Bar running along the top of the panel. But, if you are like most animators, you have already memorized the exact wavelengths of light that you tend to use. So, you can also type that wavelength directly into the Primary Wavelength field and smile knowing that the time you spent in deep thought has finally paid off.

Next, you need to decide at what angle to the camera the polygons of your surface begin transitioning - from their base color to the Primary Wavelength. This is set in the Angle Variation field. A value of 60, for example, would mean that when the polygons of the surface began to get a glancing angle of 60 degrees or less, the transition from the main surface attributes to the LW_ThinFilm attributes will begin.

Lastly you set the Color Mixing type:

Add: This will add the Thin Film color to the surface, thus increasing the color. If the RGB values of the original surface were 100,100,100 and the Thin Film RGB value for that pixel was 0,0,100 then the resultant value would be 100,100,200.

Multiply: This option takes the Thin Film value and multiplies it by a number between 0 and 1. If the pixel value is 255 it is multiplied by 1, if it is 0 it gets multiplied by 0. Any number in between will get multiplied by some value in between.

Blend: As the name states, this will blend the colors together using the Blending Percentage found to the right of the Blend button.

15. Before we load anything though, lets go to the Lights Panel and change some things. The first thing we want to change is the Ambient Intensity. As a rule of thumb, I always try to set the Ambient Intensity as low as possible. In this case we are going to set it to 0%.

Next, change the name of the only light we have sofar to "DeleteME" and set its Light Intensity to 0%. By doing that, this light will have no effect on the scene from this point forward. Later, if you wish to do some clean up you will know which light to delete.

Now, open the Objects Panel. From here, we can use Load From Scene to load in the "UFO_Lights.lws" scene that you downloaded with the other content for this phase of the project. When it asks if you would like to load the lights as well, say [Yes]; since that's the whole point of loading in this scene.

16. If you scroll through the scene with the scrub bar at the bottom of the Layout display you will notice that the lights do not follow the UFO.

As they load into the scene, all of the lights are parented to a null object named "Lighting_(NO)". To make all the lights follow the UFO, open the Scene Editor and select the "Lighting_(NO)" object, as shown in Figure 8. [Parent] "Lighting_(NO)" to the "TowTruck_UFO.lwo" object.

Render [F9] a frame to see how the lens flares change the character of the scene. Your frame should look like Figure 9.

17. Things are beginning to take shape, but there is still something missing in this scene - shadows. Open the Render Panel, and activate [Trace Shadows]. Render [F9] another frame. Now we arrive at Figure 10.

With shadows enabled, the UFO looks far more menacing hovering up there in the sky.

Next Time

Well, we have come a long way in this one session. In our next class we will be finishing things off, by adding a Steamer element for the beam that lifts the vehicle. We will also be going over some surfacing of the windshield of the vehicle as well as the creation of the spotlight on the ground.

I had hoped to use the vehicle I used for the original scene in this column, but the folks who I bought the object from had some different thoughts on that. Therefore, I will be using a vehicle from the LightWave release CD as a sample object for surfacing only. If anybody out there has a vehicle they would like to donate to this project, we will be happy to herald your name right here in the magazine. This is a good way to showcase some of the work you guys have been doing. NT

Scott Wheeler is one of three authors of LightWave 3D Applied. You can email him at uberscott@uberfx.com

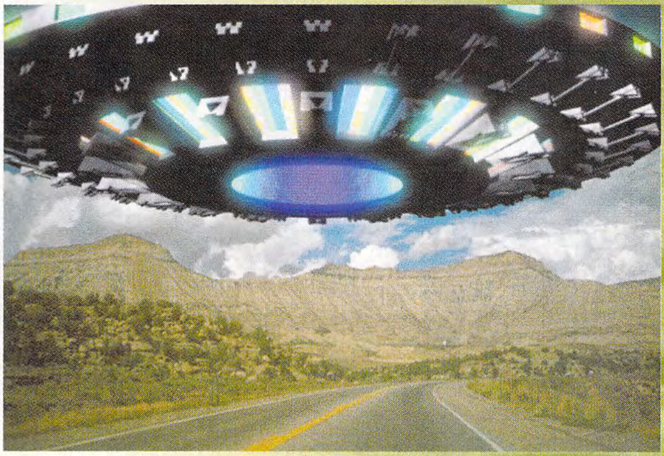
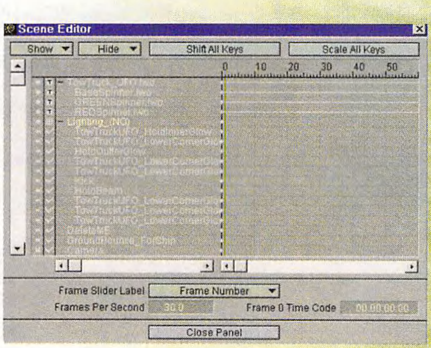


Figure 7



Frame Slider Label: Frame Number
Frames Per Second: 30.0
Frame 0 Time Code: 00:00:00:00

Figure 8

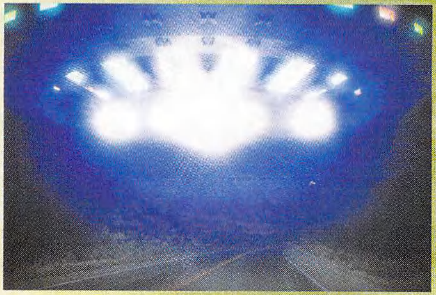


Figure 9

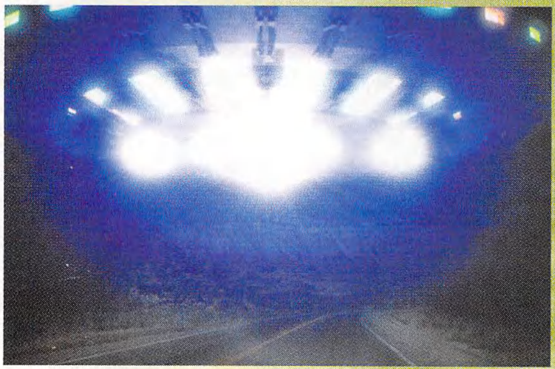
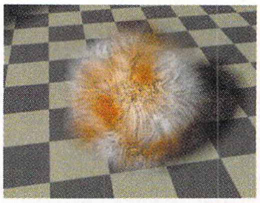


Figure 10



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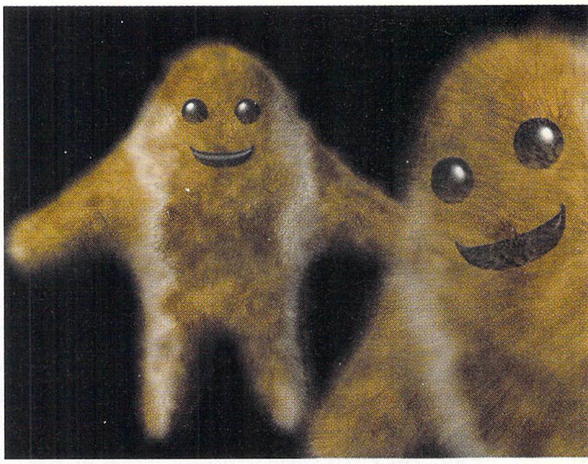
A STEP-BY-STEP GUIDE TO CREATING MORE PROFESSIONAL PRODUCTIONS

BY
DAVE JERRARD

Fun Fur Everyone

Realistic Fur



LightWave 3D is capable of creating incredibly realistic images and effects, and is used in many big budget productions, such as Titanic, Star Trek, etc. for this reason. For most people starting out, the biggest complaint is that surfaces have a plastic quality to them.

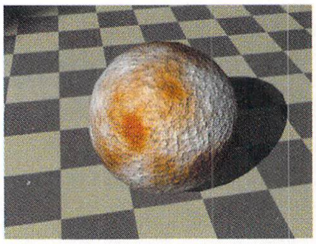


Figure 1. A stony tribble, ready for a fur coat.

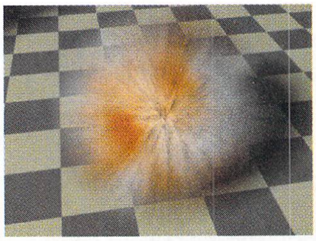


Figure 2. By adding motion blur to a rapidly contracting surface, a fur effect becomes visible.

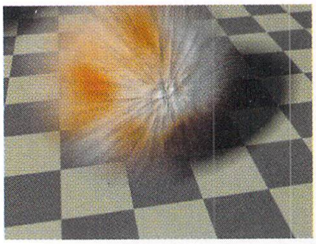


Figure 3. As the tribble moves from left to right, the fur seems to get pushed back as though the air was resisting it.

This complaint has dwindled over the past few years, with the introduction of special shader plug-ins, such as Gaffer, Polk, and a plethora of Fresnel and natural shaders. Now, you can recreate virtually any kind of surface you want, but a couple still remain elusive. Hair and fur are the toughest to do these days. Sure, there's some plug-ins that create fur, such as Fiber Factor and Particle Storm, but these tend to work by creating extra geometry on the object you're applying the fur to. This can cause severe problems when you have an object that already has a lot of detail, and you have that current 65,536 point limit per object to worry about. Even making the hair a separate object has limitations. If you create an object that uses the simplest geometry for a strand of hair, a 2-point polyline, you're limited to only 32,768 strands of hair. That's not a lot when you consider the average human head has several hundred thousand strands! Polyline strands have other problems as well.

For one, their thickness is determined in terms of pixels, defined per object in the Objects Panel. They follow the same rules as particles and are not included in ray tracing. Thus, they do not show up in reflections or refractions, and they don't cast ray traced shadows. Your characters may just have to take up the lifestyle of a vampire, and avoid mirrors and sunlight!

The other main drawback is also a particle related problem. Small clusters of points take a long time to render, and polylines have the same problem, only intensified. Since a polyline has length, it's more likely to cross over other polylines behind it, and the render times will skyrocket, particularly when the object is more distant from the camera. As the distance increases, polylines are rendered in a smaller area of the frame, using the same pixels over and over. Also, polylines are not affected by perspective, and remain the same thickness, no matter how close they get to the camera. What might look like a good head of hair at a few meters, will look extremely thin close up, and become extremely heavy and blobby looking at greater distances.

Making each strand out of three points or more can solve this perspective problem. However, this also reduces the number of strands you can have in an object. There are some plug-ins that can fill in the areas around a modeled strand of hair by using fancy shaders or pixel filters (HyperVoxels 2 and Fiber Factory, for example).

We're going to look at another method in this tutorial, which can also add some dynamic motion to the fur effect, as the furry object moves.

We'll start off simple here and create a tribble.

Trouble Free Tribbles

1. Open Modeler and create a sphere using the [Ball] tool.

Tribbles are small, so open the [Numeric] Panel and enter a Radius of 10 cm (X/Y/Z). Set the Ball Type to [Tessellation], with a Level of 2. Click [OK] and press [Enter] to Make the sphere, then save this as "Tribble.lwo".

2. Go into [Layout] and load the "Tribble.lwo" object we just created. The first thing we'll do is create a quick fur coloration, so open the [Surfaces] Panel and click the [T] beside the Surface Color. Select [Fractal Noise] for the Texture Type and set the Texture Color to brown (100, 50, 0). Set the Texture Size to 5 cm (X/Y/Z) and increase the Contrast to 2 or 3, then click [Use Texture].

While we're here, activate [Smoothing] and [Double Sided]. Set Specular Level to 100% and enable [Color Highlights]. Also, lower the Glossiness to Low, so we have a soft colored highlight.

Right now we have a smooth, cow-spotted ball, which doesn't look fuzzy at all. What we need is some roughness, which we can create using a bump map.

3. Open the Bump Map texture panel and select [Crumple] as the Texture Type. Since fuzz is made up of very small fibers, our texture should also be small and fine. Give this a [Texture Size] of 1 cm (X/Y/Z). Finally, to further refine the texture, increase the Number of Scales to 6 (or more), raise the Small Power to 1.0, and increase the Texture Amplitude to 100% to give it a strong contrast. Alternatively, a very small Fractal Bumps, or other high contrasting bump map may be used.

A test render of our tribble right now looks more stony than fuzzy, and without any antialiasing, it also looks quite speckled (Figure 1).

This grainy texture is a key factor in this technique, and the size of this texture will affect the overall look of the fur.

This stony surface works well for roughly describing the outermost layer of a fuzzy surface, but what's missing is the depth. We need strands of hair to streak outward from the surface in all directions, giving a sense of volume to the surface. We'll streak the details of our stony surface outward with Motion Blur by rapidly scaling the object once per frame.

Note: The following steps involve some lengthy render times, and look best with Antialiasing set to at least Medium.

4. Create a duplicate keyframe of the object at frame 1. Now, on frame 0, scale the object up by a factor of 2, and keyframe it there. Next, open the Motion Graph [m] for the object and set the End Behavior to [Repeat], then click [Use Motion]. This has just set up a repeating motion for the tribble, which causes it to contract from a radius of 20 cm to 10 cm, during each frame of animation.

To see this in action, open the [Camera] Panel and set Antialiasing to [Medium] or [High], then activate Motion Blur. Dithered Motion Blur will dramatically improve the effect. Finally, render a frame other than frame 0 (Figure 2).

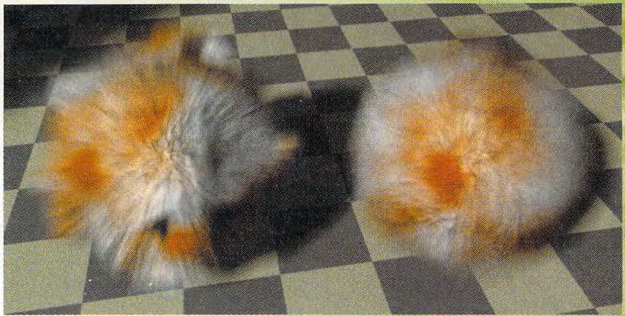


Figure 4. A fractal displacement map can create more realistic fur. The tribble on the left uses fixed amplitude, but the one on the right uses a repeating envelope to better control the fur.

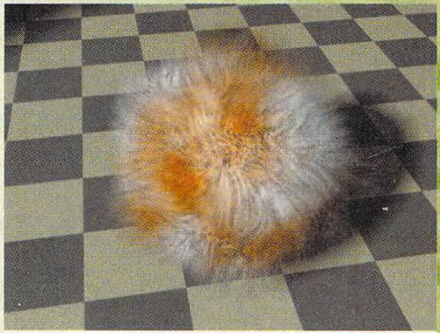


Figure 5. Adding fractal transparency to the surface allows the fur effect to also appear in shadows. Also note, that the floor is visible through the entire tribble.

When LightWave calculates motion blur, it backtracks the motions of all items in the scene towards their positions on the previous frame. Since there are no frames previous to frame 0, there's nowhere to backtrack to, so no motion blurring will appear on frame 0 (unless a negative Blur Length is used). As each frame is rendered, each successive antialiasing pass renders a slice of time further back towards the previous frame. Since our tribble is contracting rapidly during a frame, the first pass will render it at its normal size, and the tribble will seem to grow as each successive pass is rendered. The order in which this occurs plays an important part in the next steps as we exploit an interesting side effect of this technique.

Note that the tribble will not be seen to scale up by a full factor of 2, since the default Blur Length is 50%, and only half the motion that occurs during any given frame will actually appear in the final image. This means that the maximum visible expansion will be a factor of 1.5, which is half way between the two scale factors we keyframed. To adust the length of the fur, we only need to adjust the scale factor at frame 0. Keep in mind that with the default Blur Length, the fur effect will only cover half the area. If you want 5 cm thick fur, then you'll need to make sure the surface moves 10 cm during the frame, since only 50% of that motion will be recorded. Feel free to try various scales to get a feel for what's going on.

At first glance, this technique might seem to be only effective with still images, but it does lend itself to animation better than you might think. LightWave renders the motion blur passes progressively, rendering each pass back further in time; so, if our tribble were to also move across the frame from left to right, the very first render pass would show it at the end of its motion for that frame. Then each successive pass would show the tribble slightly more to the left, as it worked backward towards the tribble's position in the previous frame. Each one of these passes would also render the tribble slightly larger as well, since it's not only moving left to right, but

also contracting in size. The result will be more streaking behind the tribble than in front of it, giving the illusion that the fur is being pushed, or blown back by air resistance.

5. To see this in action, add a Nullobject and parent the tribble to it. Now create a simple ten-frame motion for this null, creating a keyframe for it near the left side of frame 0. Next, advance to frame 10 and move the null to the right side, and create another keyframe. Finally, go back a few frames and use [F9] to do a test render. You should see something similar to Figure 3.

Since we have a repeating motion set up to change the scale of the tribble, we can't move it directly without interfering with that scale change. Instead, we need to use a null to provide the motion.

As the tribble moves, the fur on the leading side tends to blur less, giving a shorter flattened appearance, while the fur on the trailing side seems stretched. The rest of the fur angles back, as though it was wind blown. This effect is proportional to the speed the tribble moves, which has the side effect of giving the fur dynamic motion. If we had the tribble expand, rather than contract, then this effect would be reversed, with the fur appearing to lead the object, rather than follow it.

Now that we have the basics for the technique, let's fine-tune them. You may have noticed that the fur always radiates outward in straight streaks, rather than in random directions as you would normally see on something fuzzy. So, let's tangle this up a bit.

6. Open the [Objects] Panel for the tribble. From the [Displacement Map] panel, select [Fractal Bumps] as the Texture Type. We want to add a small amount of jitter to the object, so lower the Texture Size to 5 mm. All that's left is to control the amount of object distortion. We want the fur to distort more at the end than at the base, and to do that, we'll use a repeating motion envelope. Click the [E] button beside the Texture Amplitude and change the Current Value for the first key to 0.04. Create a second key at frame 1, and set it's Current Value to 0. This envelope will apply the displacement to the object while it's scaled up, and then reduce that displacement as the object contracts back to a perfect sphere again. Finally, set the End Behavior to Repeat, and render a test image again.

Figure 4 shows two tribbles rendered with fractal displacement applied. The first tribble uses a Texture Amplitude of 0.04, with no envelope applied. What basically happened in this case was that the displacement was applied, and then simply scaled by the motion envelope we used originally. The result is that the streaks continue to radiate outward in straight lines. The same results could have been achieved if we just jittered the object in Modeler before saving it.

The second tribble uses the envelope on the Texture Amplitude, which causes the streaking to change direction during the frame. This results in clumps and swirls in the fur effect, which looks more natural. Again, changing the Texture Size of the displacement map, as well as the amplitude, can create a wide range of fur effects. Also feel free to play with the Spline Controls for the envelope.

Note: When using displacement maps, it's strongly recommended that the object consist only of triangular polygons to prevent render errors.

There is one other thing we can adjust to fine tune this effect. As it is now, our fur is casting a solid shadow (though soft edged due to the motion blur) as can be seen in Figures 1-4. We can add detail to the shadows and, at the same time, add a little more detail to the fur itself. Before we go any further, let's save a couple copies of our tribble since we'll need them soon.

7. Rename the current surface to "Tribble", then save the object as "Tribble.lwo". Next, rename the surface to "Tribble Fur", and save the object again, this time as "TribbleFur.lwo". We now have two versions of the current tribble object saved, and we have "TribbleFur" as the currently loaded object, so we're ready for the next step.

8. In order to get detail to appear in shadows, we need to apply some transparency to the surface to let light leak into the shadows. Click the texture button [T] for the Transparency channel, and select [Fractal Noise] as the Texture Type. We only need a very small, grainy texture, so set the [Texture Size] to 5 mm and raise the Texture Value to 75%. Also, increase the Contrast to 10 and the Small Power to 2.0, so that we have a strong, highly detailed transparency pattern.

Also, since this surface is now partially transparent, you may want to activate the Sharp Terminator option in the Surface Panel to increase the intensity of the edges.

Click [Use Texture], then open the [Render] Panel. To see shadows, we'll need to activate the Trace Shadows option there.

9. We'll also need a surface for the shadows to fall on, so load the "Ground.lwo" object from the "Objects/Landscape" folder. You might want to change the color to white to make things easier to see. You can do this quickly by clicking the [Load Surface] button in the [Surfaces] Panel, and selecting the "Flat/flatwhite.srf" surface file.

Note: A Clip Map with these settings, rather than a Transparency Map, will render much faster, and allow the use of shadow maps. But, this may also make the fur appear thinner. Clip Maps remove parts of an object from the rendering process, while Transparency still allows highlights and reflections to be seen. A Clip Map would result in the loss of highlights in the transparent sections, preventing any streaks from rendering in the transparent areas.

Finally, make sure the light's Shadow Type is set to [Ray

Trace] and then press [F10] to render another test.

This image will take a bit longer since it's ray tracing shadows through two layers of fractal transparency (the surface is double sided so both the inside and outside are casting shadows). You might want to keep the image size smaller to save time. When it's done, you should see something similar to Figure 5.

You will notice a few things that are different now. First, is that the furry look now appears in the shadow too. Second, the actual fur effect itself has been emphasized, with more contrast appearing in the streaks. Also, due to the transparency we applied to it, we can now see through the tribble in most areas, making it look more like something a cat might have coughed up, than a living creature. This thing needs a body!

10. Load "Tribble.lwo" and parent the "TribbleFur.lwo" to it. Since the fur object will now move along with the body object we just added, it would be a good idea to deactivate the motion channels for the fur, so it doesn't accidentally get adjusted later. Select the "Tribble Fur.lwo" and then click the [Move] option under the Mouse functions on the left. Below that, turn off the [X], [Y] and [Z] buttons. Do the same for [Rotate] and [Size] as well. This effectively locks the object, preventing it from being moved without first activating at least one of those motion channels. This is a handy tip that applies well to any hierarchy.

11. Now that we have our fur object attached to a body, we can do another test. Before we do though, let's surface that body a little better. Currently, it has the exact same texture as the fur, which may tend to overpower some of the subtle shading we're getting from the blurring. All we really need to do is make it a bit darker, so select the "Tribble" surface and lower the Diffuse Level to at least 50%. We'll keep the same fractal color textures though, since most animals in the real world have skin pigmentation that matches their fur patterns.

We can, however, lower the Frequencies of the Fractal Noise coloration, to speed up the rendering of this surface. Open the Color Texture panel and change the Frequencies to 1, then click [Use Texture].

What we don't need is the bumps, so open the Bump Map Panel and click [Remove Texture]. We should now have a slightly darker, smooth body for our tribble. A test render of frame 1 should look something like Figure 6. Note the fur details in the shadow, and a solid body hidden underneath the fur.

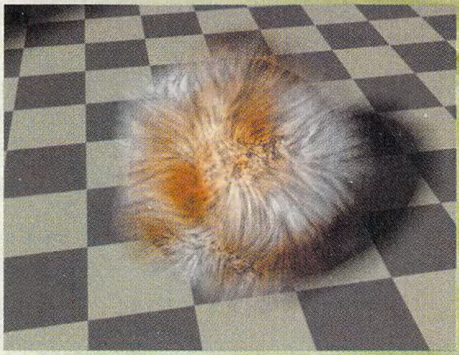


Figure 6. Adding the fur on top of a base object makes the tribble appear to have a solid body.

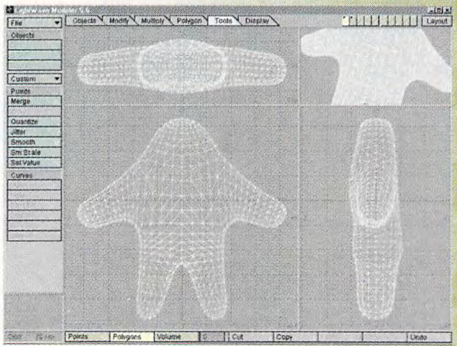


Figure 7. The body of our furry critter, tripled and ready for the next step.

Critters With Limbs

Now that we have our cute, cuddly tribble figured out, let's try something a little more challenging. Most critters don't have nice, round bodies; so what we've done so far isn't too useful if you want creatures with arms, legs, or something else sticking out of them. For creatures like these, we need a thicker version to create the fur, not just a scaled up version. We'll also need a slightly different technique of blurring the fur - what we might call "flurring".

12. Let's go back to Modeler, and clear everything out of memory [Shift-n]. We'll create another cute little creature, starting with a strange little character that can be found lurking on the LightWave CD, in the "Objects/jun-y" folder.

Load "Chara1.lwo" into the first layer, then open the Change Surface Panel [q]. We'll change the surface name to "FurGuy", and at the same time, we'll give him a brown color. RGB values of 170, 135, 85 will do nicely. Make sure Smoothing is also set, and then click [Apply]. Before we go any further, this object should also be tripled since we'll be deforming it later, so press [Shift-t]. See Figure 7.

Save this as "FurGuy.lwo", to be used as the body portion of our critter.

13. Copy this object, and paste a copy of it into layer 2. Place layer 1 into the background so you have a reference to the original object.

Now we'll create the fur object. Since this object is an irregular shape, scaling it will not produce the results we want. If we did scale it, we would end up with much more fur at the ends of the arms and legs, and very little on the body itself, since the extremities would scale outward further than the rest of the object. We want to have all the polygons shift outward from their original positions the same amount, making a thicker object. Smooth Scale will do this very nicely.

Before we can do the Smooth Scale, we need to decide on how much fur we apply to this guy. The amount can always be fine tuned later in Layout, but it's always a good idea to model what you really need from the start. Sloppy modeling can have a drastic impact on render time and quality.

We'll start this guy off with a

nice short coat of fur, about 4 cm thick. Open the [Smooth Scale] tool (under the [Tools] tab) and enter a value of 4 cm for Offset, then click [OK]. You will now have a duplicate object that's 4 cm thicker all around (Figure 8). Note: For LightWave 5.0 and earlier, since there is no Smooth Scale available, you will need to manually scale the object, one section at a time, using the [Size] and [Stretch] tools on selected areas.

14. Open the [Surface] Panel again, and create a new surface called "FurGuy-Fur". Save this object as "FurGuy-Fur.lwo", then go back to Layout.

15. Clear the scene - be sure to save everything first, and then load "FurGuy.lwo" and "FurGuy-Fur.lwo". Parent the fur object to the "FurGuy" body, and then deactivate the motion channels for the fur - just like we did with the tribble in step 10.

16. Once again, we need to give the fur surface some texture, so open the [Surface] Panel and select the "FurGuy-Fur" surface. Since this object is larger than the tribble, some of the textures may need to be adjusted for the object's size, such as the Transparency texture. If the details of a texture are too small, the fur effect will tend to look more like a grainy glow than fur. The following settings will give us a nice teddy bear fur effect:

- Surface Color: 170, 165, 85
- Color Texture
  - Texture Type: Fractal Noise
  - Texture Size: 10 cm
  - Texture Color: 115, 80, 35
  - Frequencies: 3
  - Contrast: 1
  - Small Power: 1

- Diffuse Level: 85%
- Sharp Terminator: ON
- Specular Level: 50%
- Color Highlights: ON
- Glossiness: Low
- Transparency: 0%
- Transparency Texture
  - Texture Type: Fractal Noise
  - Texture Size: 10 mm
  - Texture Value: 75%
  - Frequencies: 3
  - Contrast: 10
  - Small Power: 2

- Smoothing: ON
- Double Sided: ON
- Bump Map
  - Texture Type: Crumple
  - Texture Size: 10 mm
  - Texture Amplitude: 100%
  - Number Of Scales: 6
  - Small Power: 1

If you want to give this fellow some snazzy stripes, try replacing the Fractal Noise Color Texture with the following Marble texture, or simply add it as a second texture layer. This will create a marble vein that runs from the shoulder to the leg on each side of our critter.

- Texture Type: Marble
- Texture Axis: X Axis
- Texture Size: 10 cm
- Texture Color: 255, 235, 205
- Frequencies: 3
- Turbulence: 0.15
- Vein Spacing: 0.6
- Vein Sharpness: 6.0

17. Now that we have the fur textured, let's give the little guy some matching skin tones. [Render] a texture sample, then select the "FurGuy" surface. Click on the texture sample we just created in order to copy those texture settings to this surface. Again, this is the skin surface, we don't need a lot of detail, so feel free to lower the frequencies of the color texture, and remove both the Bump Map and the Transparency texture. Finally, lower the Diffuse Level to 50% and the Specular Level to 0%. Now we need to activate the fur.

This object can't be scaled like our tribble, so we need another method to vibrate the fur object. Since we created the fur object by Smooth Scaling the original body, its point order is identical to the body, allowing these two objects to be used for morphing. If we were to morph "FurGuy-Fur" to "FurGuy" rapidly, we would once again have our contracting motion.

Note: Although Smooth Shift may appear to do the same thing as Smooth Scale, it changes the point order of the object, resulting in an object that cannot be morphed.

18. To set up the morph, open the Objects Panel and select the "FurGuy-Fur.lwo" object. Under the Deformations tab, select "FurGuy.lwo" as the Morph Target, then click the [E] above it to open the Morph Envelope editor.

Since we want to contract this object over the duration of a single frame, we'll be morphing towards the target object, so create a new key at frame 1 and set its value to 95%.

Normally we would use a value of 100%; but in this case, both the target and the source objects are not only visible, but also in the same place. At a 100% morph, both objects would be the exact same shape, resulting in render errors due to the polygons of one object sharing the same planes as the polygons of the other (Figure 9). By keeping the maximum morph percentage slightly lower, we ensure that the polygons of the fur object are always positioned slightly outside of the body polygons.

Make sure the value for frame 0 is set to 0%, then set the End Behavior to [Repeat]. Click [Use Envelope] and we're ready to do another test render.

19. Open the Camera Panel and activate Antialiasing, Motion Blur and Dithered Blur. Again, the higher the antialiasing level, the better the fur will look. Finally, render frame 1 (not 0) to see the 'flurring' in effect.

Since our fur object is 4 cm thicker than the body, the default 50% Blur Length will result in a 2 cm thick coat of fur (Figure 10).

20. He doesn't look half bad, but that fur is just a little too evenly distributed again. We need to add a bit of randomness to the fur, like we did

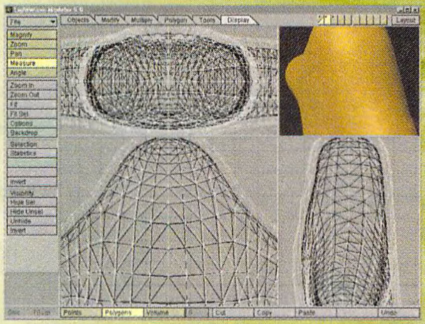


Figure 8. The Smooth Scaled fur portion of our critter, shown against the original version in the background layer.

with the tribble, so open the Objects Panel again and click the Displacement Map button. Select [Fractal Noise] as the Texture Type, and then click the [Texture Size] button. The size here really doesn't matter too much, but should be no greater than 1/10 of the object itself. Generally, the smaller the better as we want each point to be displaced in a different direction. A size of 1 mm generally works well in most cases, but feel free to experiment. The important part of this step is to use a Texture Amplitude envelope that matches the morph, so once again, click the [E] button to open the Amplitude Envelope editor. Since this character is a little larger than the tribble, we can afford to displace the fur a little more, so change the value at frame 0 to 0.08. Next, create a second key at frame 1 and set the value for that key to 0. Finally, set the End Behavior to [Repeat] and click [Use Envelope], then [Use Texture]. A new render will show our critter looking more like a cuddly teddy bear (Figure 11).

With the fur being only 2 cm thick, the effects of the Displacement Map are a little exaggerated in areas, appearing as extra long tufts of fur in some areas. This is easily adjusted by changing the initial displacement amplitude, or just as easily by making the rest of the fur longer.

21. Open the Morph Envelope editor again, but this time change the value at frame 0 to -100%.

Another test render will show our little fellow with 4 cm long fur (Figure 12).

This will effectively double the amount of the morph by reverse-morphing the source object away from the target shape. Now as the object morphs, it has to first morph from this reversed shape at -100% to its natural shape at 0%, and finally on to the target shape at 95%.

Each point moves in a straight line defined by the source and target object's geometry. Negative amounts will simply move each point further back along that line, with each 100% being equal to the distance between the point's source and target positions. With a 50% Blur Length, only half of this total morph distance will be rendered-so a morph from -200% to 100% would result in everything from -50% to 100% being seen in the final image. Remember, only the last portion of movement during a frame is actually rendered - the amount determined by the Blur Length.

While we're morphing the object to create fur, we can also morph the surface. The fur of most animals changes color from follicle to tip, and we can simulate this by activating the Morph Surfaces button on the Objects Panel for our fur object.

This will take a little more planning since now we need to decide what color the fur should be at both the tips and the roots. The color we apply to the fur object itself, in this case

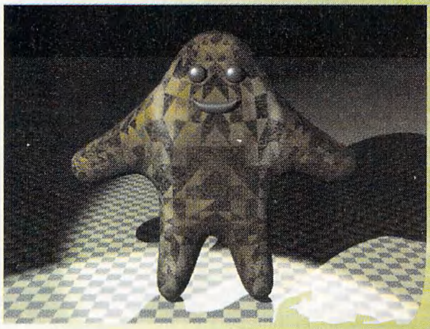


Figure 9. The rendering errors that occur when the fur surface is coplanar with the underlying body surface. In this case, the fur is not visible, but its shadows are, creating the triangular patterns on the body.

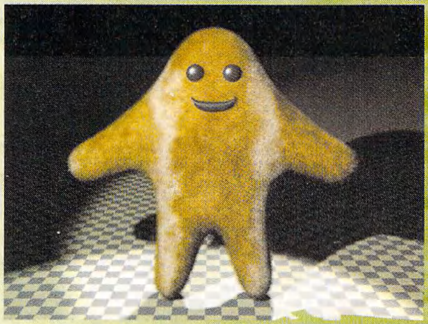


Figure 10. A quick fur effect created by morphing.

"FurGuy-Fur", will always be the tip color. The color of the target object becomes the root color. Our current setup is using the body itself as the target, so the skin color will become the root color. If we want to have a different base color than the skin, then we'll need a second fur object that we can use as a target, rather than the body. This is simple enough to add.

22. To create the new target object, we can simply save a new copy of our body. Open the Objects Panel, and click [Save All Objects] first. Next, open the [Surface] Panel and select the "FurGuy" surface and rename it to "FurGuy-Roots". Now go back to the [Objects] Panel and select the "FurGuy.lwo" and save this as "FurGuy-Roots.lwo". We now have two objects of identical geometry saved, but with different surfaces, and we have the object we'll use as the root color currently loaded.

Since this object will only be used as a morph target, we really don't need to render it, so click the [Appearance Options] tab and raise the Object Dissolve level to 100%. This will prevent the object from being rendered, but won't stop it from affecting the morph we have set up.

23. Since we now have two fur objects, one of which is

Continued on page 50

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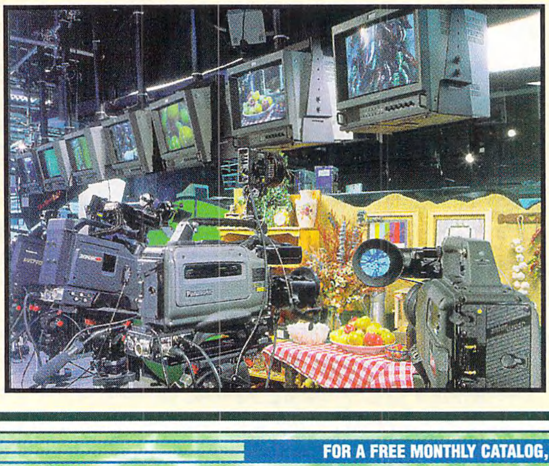

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QUICK DIAL 74

Canon

XL-1 3-CCD Camcorder with Interchangeable Lens Mount

With 3-CCDs, exclusive interchangeable XL Lens Mount System, unmatched optical technology, SuperRange Image Stabilizer, DV and simultaneous four channel audio recording, the XL-1 offers unmatched image quality and shooting versatility.

Interchangeable XL Lens Mount System
- Interchangeable XL lenses for unsurpassed flexibility and multi-coated optics to achieve 600 lines of resolution.

16:1 Optical Zoom with SuperRange Image Stabilizer
- The 16:1 has a focal length range of 5.5 to 88mm (35mm equivalent of 39 to 633mm). It offers variable speed zoom, manual zoom and manual focus control and has a one-push auto-focus button and built-in 1.5X ND filter.
- The SuperRange Optical Image Stabilizer uses a motion vector to examine the image after it is received by the CCD to detect any shake.

Digital Audio
- Three digital audio modes (16 bit and two 12 bit modes) and simultaneous recording of four separate tracks. You can output each signal independently.
- Audio inputs with independent level controls.

3-CCDs
- Three 270,000 pixel CCDs with advanced Pixel Shift technology achieves 530 lines of resolution.
- Large 72 micron CCDs deliver a 4dB improvement in sensitivity.

Three Recording Modes:

Unique Design & Dual Action Carrying Handle

Additional Features: • 180,000-pixel color viewfinder
- Automatic and manual white balance, gain (five preset levels from -3 to +12dB) and exposure lock.
- Zebra pattern and color bar generator
- Composite, S-Video output, DV (IEEE 1394) in/out, Control L
- Digital fader and wide screen TV effect
- Headphone jack with level adjustment
- Remote control with jog/shuttle dial

Panasonic
Broadcast & Television Systems

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AG-EZ1 3-CCD Digital Video Camcorder

- Digital recording delivers 500 lines of horizontal resolution with no noise. (S/N ratio is 54dB).
- 10:1 power and 20:1 digital zoom lens. Both zooms are adjustable in four speeds (3.5-15 sec.) For extreme close-ups the lens can focus up to 1/4" from the subject.
- Two digital audio modes, choose between two-channel 16-bit stereo recording or two sets of 12-bit stereo.
- Huge 1.5" 180,000 pixel color viewfinder with 400 lines of resolution displays all functions on demand.
- Digital Electronic Image Stabilizer (DEIS) compensates for jittery video. Particularly effective when the digital zoom is employed.
- Variable speed shutter from 1/60—1/8000 of a second
- Built-in SMPTE time code generator.
- Digital Photo-Shot lets you record a still-frame for six seconds, while audio continues as normal. 290 still pictures can be recorded on a single 30-minute tape. TopScan function finds any shot easily.

$1995

AG-EZ30 World's Smallest 3-CCD Camcorder w/IEEE1394 Interface

The AG-EZ30 combines 3-CCDs and the DV format to deliver a level of picture and sound quality that makes it one of the most advanced camcorders of its kind. Weighing just 1.5 lbs. this incredibly lightweight camcorder also incorporates a large 2.5-inch color LCD monitor and has a host of sophisticated auto functions as well full manual control when required.

- 3-CCDs (270,000 pixels each) with a large light-collecting area give the camera high sensitivity and wide dynamic range. Double-density pixel distribution and a gapless dichroic prism further ensure razor-sharp images and extremely faithful color reproduction.
- Selectable 2-channel 48 kHz/16-bit or 4-channel 32 kHz/12-bit PCM audio recording.
- Built-in stereo mic and external mic input as well.
- 180,000 pixel, 2.5-inch color LCD monitor. Also has a 0.5-inch color viewfinder.
- Digital Image Stabilizer for clear, shake and jitter free shots.
- 12X optical zoom as well as 30X and 120X digital zoom functions. Move from wide-angle to full zoom in 1.3 seconds allowing quick framing while in REC pause.
- Offers six digital effects: Wipe, Mix, Strobe, Gain-Up, B&W and still mode.
- Large-diameter focus ring enables a high level of focusing precision. A Multi-Function Push Dial allows easy setting of the 16-step iris, 5-step gain control (+12dB maximum) and 14-step shutter (up to 1/8000 second). Mic input level can also be set in steps (-20/-10/0/+3/+6 dB).
- Five program AE modes for shooting in a variety of different conditions. There is also a five-mode white balance: Set , Fluroescent, Auto, Indoor and Outdoor.

SONY

DCR-PC1 Miniature DV Camcorder

- Sony's smallest DV camcorder ever, yet still feature packed and with the same excellent quality
- 1/4" 680,000 pixel CCD imager designed specifically for DV picture quality
- Equipped with Carl Zeiss 10X optical precision zoom lens for unparalleled detail and clarity. Also offers a 120X digital zoom
- 5 Lux minimum illumination
- Crystal clear still/slow motion playback
- Edit search allows you to review the last several seconds of video without leaving the camera mode
- 7-mode Program AE allows for proper exposure and image quality in a variety of situations: Soft Portrait, Beach & Ski, Sports Lesson, Landscape, Spotlight, Sunset & Moon, and Low Light
- 16:9 wide mode allows you to record and playback in a 'widescreen' aspect ratio

DCR-TRV900 3-CCD DV Camcorder

- Three CCDs with 380,000 pixels each for excellent color fidelity and higher S/N ratio
- Progressive Scan CCD delivers clean edges and an overall sharper picture for still images
- 12X optical and 48X digital zoom lens
- 4-lux minimum illumination
- Analog recording capability lets you record from analog sources like Hi8 & S-VHS and master onto DV cassettes
- Zebra pattern indicator for over exposure, and color bar generator for properly adjusting your monitor
- Interval and frame recording for single frame recording and time-lapse effects
- Up to 8 hours recording time with optional NP-F950 InfoLithium Battery
- Crystal clear still/slow motion playback
- Intelligent accessory shoe provides synchronized operation of lights and microphones, automatically
- LaserLink system provides wireless connection of up to 16-feet between the camcorder and TV (requires optional IFT-R10 receiver)
- 5-mode Program AE for proper exposure in a variety of situations: Aperture priority, Shutter Speed priority, Sports Lesson, Sunset & Moon, Low Lux

Memory Mode:
- Memory mode allows you to capture still images and save them to a floppy disc (with supplied adapter), or an optional Memory Stick. You can also automatically copy all of your still images from your mini DV cassette tape directly to a floppy disk (w/supplied adapter)
- Capture images in JPEG file format with a choice of three different quality modes: Standard, Fine, and Super Fine. Save in JPEG format where they can be viewed on any Mac or PC. When you open the images, you will see large 640 X 480, 24-bit color detailed shots
- Date/Time stamp automatically writes the date and time to the file information
- Delete/Protect function allow you to save your favorite shots or delete undesirable ones
- Continuous record mode allows you to capture 4 shots successively in just a few seconds
- Index mode lets you preview six thumbnails at a time. Create a slide show of your favorite shots for playback

SONY

DSR-PD100 3-CCD Mini DVCAM Camcorder

The smallest DVCAM camcorder, the DSR-PD100 is also the first one with built-in image capture capability. The highly compact camcorder features three 1/4" 380,000 pixel CCDs that allow two scanning modes: 480 progressive (for stills) or interlaced (for video).

- Three 380,000 pixel CCDs complement DVCAM with a high standard of quality for this class of camera. DVCAM offers superior video and audio quality, and reliability for professional use
- The CCD's can be switched to scan in two ways: Interlace Scan for recording moving images and Progressive Scan for recording still images
- Super SteadyShot compensates for unwanted camera movement without reducing image quality
- A built-in 12X zoom lens is supplemented by a 48X digital zoom that can provide really close up shots
- Manual control of focus, gain, white balance and shutter speed. Also has full automatic control
- i.LINK interface provides a single cable connection to transfer digital video and audio
- Records PCM digital stereo sound in both 48 kHz mode (16-bit) and 32kHz mode (12-bit). When a recording has been made in 12-bit mode, another stereo channel can be added later
- The DSR-PD100 has a 3.5" color LCD monitor with 184,000 pixels, opening 90° to the side and swiveling 180°. Also has a 180,000 pixel color viewfinder.
- Can record still images on both tape or removable media, such as Memory Stick
- Start/Stop/Zoom of the camcorder and VTR operation, plus slow playback or search can be controlled by the supplied wireless remote commander
- Supplied XLR adaptor attaches onto the hot shoe of the camcorder, allowing external professional microphones to be connected to provide high quality audio sources. Through XLR adaptor, DC power (+48V for a microphone is also supplied from the DSR-PD100
- A 0.7X wide conversion lens is supplied, complete with lens hood, lens cap and protective bag
- Includes 4 MB Memory Stick and Memory Stick/PC Card Adaptor
- Weighs just 1kg (2.2 lbs) with a battery and a tape. A magnesium alloy die cast body keeps it light but robust

DSR-200A 3-CCD Digital (DVCAM) Camcorder

Combining a compact and lightweight body with the superior picture quality of DSP (Digital Signal Processing) and the DVCAM format, the DSR-200A is the ideal acquisition tool for video journalists, event and wedding videographers, stringers and production houses. 500 lines of horizontal resolution, 48kHz or 32kHz digital audio, three hour record time, and minimum illumination of 3 lux is only the beginning. Other features include 16:9/4:3 capability, Steady Shot, high resolution 1-inch viewfinder, time code operation, time/date superimposition and an IEEE-1394 interface for direct digital output. Offers full automatic as well as manual control of focus, iris, gain, white balance and shutter speed.

- Variable servo 10X optical power zoom lens goes from 5.9 to 59mm in 1.7 to 24 seconds. The manual zoom rocker is continuously variable right up to where the digital 20X zoom kicks in.
- Sony's Super Steady Shot reduces high frequency camera shake without compromising image quality. SteadyShot uses horizontal and vertical motion sensors that allow it to work accurately while zooming, moving (even shooting from a car), and shooting in low light conditions.
- Has digital effects including audio and video fade, overlap and Slow Shutter.
- Automatic and manual focus, iris, shutter, gain and white balance. Iris is adjustable in 12 levels from F1.6 to F11, shutter from 1/4 to 1/10,000 of a second in 12 steps, Gain from -3dB to +18dB in 8 steps.
- Zebra Pattern indicator, bult-in ND filter.
- Custom Preset function lets you preset, store and recall custom settings for color intensity, white balance (bluish or reddish), sharpness and brightness.
- Stores Photo, Date/Time, Shutter Speed, Iris, Gain and F-stop for easy recall. So if you have to re-shoot, you know your original settings for every scene and frame.
- Records Drop/Non-Drop Frame time code. Time code can be read either as RC time code or as SMPTE time code
- Has a large 1-inch B&W viewfinder with 550 lines of resolution for easy focusing even in low contrast lighting situations. Separate information sub panel displays time code, battery time, tape remaining and other camcorder functions without cluttering up the viewfinder.
- Records 16-bit/48kHz audio on one stereo track or 12-bit/32kHz with two pairs of stereo tracks (L1/R 1, L2/R2), so you can add stereo music or narration.
- One-point stereo electret condenser mic for clear stereo separation. Directivity can be selected from 0°, 90° & 120°.
- Automatic & manual (20-step) audio level record controls. Monitor audio with headphones or from the LCD panel which has an active VU meter.
- XLR input connectors for mics and audio equipment.

DSR-200A Field Package:
- DSR-200A Camcorder • NPA-1000/B Battery Case Adapter
- 3 NP-F930/B 7.2v 4000 mAH Batteries
- AC-V900/B AC Adapter, Triple Battery Charger
- VCT-U14 Tripod Adapter • LC-2000CP System Case

DSR-20 DVCAM Player/Recorder

The DSR-20 is a versatile DVCAM VCR with a very compact chassis and a variety of convenient functions for recording, playback and simple editing. It features auto repeat playback, power-on recording/playback, multiple machine control interfaces, AC/DC capability and i.Link (IEEE1394) input and output. And of course, it offers the stunning image and sound quality inherent to the DVCAM format.

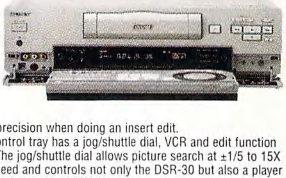
DVCAM Quality
- Dual-size cassette mechanism accepts both mini size (up to 40 minutes) and standard size DVCAM tapes (up to 184 minutes) without an adapter.

Editing Capability
- Equipped with Control L interface, the DSR-20 can perform simple time code-based editing when connected to another DSR-20 or other similarly equipped VCRs/cameras like the DSR-30, DSR-200A or DSR-PD1. When using the FXE-120 or ES-3 EditStation System, the DSR-20 can serve as a feeder player.
- Has DV (IEEE1394) input and output. When connected to other DV equipped machines, the DSR-20 offers digital dubbing of video, audio and data, without any deterioration of image and sound quality. In addition, in the "Digital dubbing including TC copy" mode, full information of video, audio and time code of the original tape can be copied to another tape. Especially useful when making working copies of the original.

Record/Playback Functions
- In addition to Control L, the DSR-20 also incorporates a Control S and RS-232 interface for remote control operation. Basic VCR functions can be controlled from a PC via RS-232, while Control S allows control via the optional DSRM-10 Remote Control. In addition, with the Control S input/output connector, two or more (up to 50) DSR-20's can be daisy-chained and controlled from one DSRM-10 Remote Control.
- External sync input enables synchronized playback with other VCRs. Especially important in A/B roll configurations.

Conveniences
- The DSR-20 be powered by AC or DC. Ideal for mobile applications, the DSR-20 can be connected to a 12V power supply like a car battery or battery belt & powered via the 4-pin XLR DC input.
- Can perform searches for Index Points, which are recorded on the tape as "in-point" marks everytime a recording starts. The DSR-20 can also search for photo data recorded on a DVCAM cassette by the DSR-PD100/200A/300, or where the recording date has been changed.
- Supplied with the RMT-DS20 Wireless Remote for control of basic VCR functions. And again, when two or more VCRs are connected via Control S, they can be simultaneously controlled from one wireless remote by simply sending one command to the master deck.

DSR-30 DVCAM Digital VCR



The DSR-30 is an industrial grade DVCAM VCR that can be used for recording, playback and editing. DV standard 4:1:1 sampling digital component recording with a 5:1 compression ratio provides spectacular picture quality and multi-generation performance. It has a Control L interface for editing with other Control L based recorders such as the DSR-200A DVCAM Camcorder or another DSR-30 . It also has a continuous auto repeat playback function making it ideal for kiosks and other point of information displays. Other features include high quality digital audio, IEEE-1394 Digital interface and external timer recording. The DSR-30 can accept both Mini and Standard DVCAM cassettes for up to 184 minutes of recording time, and can playback consumer DV tapes as well.

- Records PCM digital audio at either 48kHz (16-bit 2 channel) or at 32kHz (12-bit 4 channel) .
- Equipped with Control L, the DSR-30 is capable of SMPTE Time Code based accurate editing even without an edit controller. Built in editing functions include assemble and separate video and audio insert .
- By searching for either an Index point or Photo Data recorded by the DSR-200A camcorder, the DSR-30 drastically cuts the time usually required for editing. The DSR-30 can record up to 135 Index points on the Cassette Memory thanks to its 16K bits capability.
- Audio lock ensures audio is fully synchronized with the video for absolute precision when doing an insert edit.
- Built-in control tray has a jog/shuttle dial, VCR and edit function buttons. The jog/shuttle dial allows picture search at ±1/5 to 15X normal speed and controls not only the DSR-30 but also a player hooked up through its LANC interface
- DV In/Out (IEEE 1394) for digital dubbing of video, audio and data ID with no loss in quality.
- Analog audio and video input/outputs make it fully compatible with non-digital equipment. Playback compatibility with consumer DV tapes allows you to work with footage recorded on consumer-grade equipment. Tapes recorded in the DSR-30 are also compatible with Sony's high-end DVCAM VCR's.

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QUICK DIAL 72

SONY

UVW-1400A Betacam SP Recorder

The UVW-1400A is a non-editing VCR which deliver Betacam SP quality and offer features for a wide range of playback and recording applications. RGB and RS-232 interface make it especially ideal for large screen, high quality video presentation, scientific research and digital video environments.

- Ideally suited for work in computer environments, because RGB signals can be converted into component signals and vice versa with minimum picture degradation.
- 25-pin serial interface allows external computer control of all VCR functions based on time code information. Baud rate can be selected from between 1200 to 38,400 bps.
- Built-in Time Base Stabilizer locks sync and subcarrier to an external reference signal as well as provides stable pictures.
- Built-in LTC Time Code and UB (User Bits).reader/generator
- Equipped with two longitudinal audio channels.
- Auto repeat of entire or a specific portion of the tape.
- Built-in character generator can display VTR status, time code, self-diagnostic messages, set-up menu, etc.
- Control of jog, shuttle, playback, record, pause, FF and REW with the optional SVRM-100A Remote Control Unit.
- Composite and S-Video as well as component via BNCs which are switchable to RGB output. The UVW-1400A has two switchable sync connectors and a Sync on Green.
- Built-in diagnostic function and hour meter.
- Initial set-up menu for presetting operational parameters.

UVW-1700G

Betacam SP Computer Graphics Frame Recorder

The UVW-1700G has all the features of the UVW-1400A (except foot switch control) plus it adds frame accurate video insert editing capability as well as RS-232 and RS-422 interfaces. These make the UVW-1700G ideal not only for conventional video program production but also for animation and computer graphics creation.

Same features as the UVW-1400A *PLUS*—
Uniquely equipped with both RS-232 and RS-422 serial ports for versatile system integration. Both serial ports are easily accessed via the set-up menu. Built-in time code capability combined with sophisticated servo servo system ensures frame accurate insert editing (video only) when connected to computer-based editing systems (via RS-232 port) or RS-422 equipped edit controllers. Ideal VCR for animation and computer graphics creation, where frame-by-frame editing is indispensable.

UVW-1800 Betacam SP Editing Recorder

All the features of the 1400A *PLUS*—

- Optional UVR-60 allows remote TBC adjustment.
- RS-422 interface for editing system expansion.
- Two types of component output; via three BNC connectors or a Betacam 12-pin dub connector.
- Frame accurate editing is assured, thanks to sophisticated servo control and built-in time code operation. In the insert mode of the UVW-1800, video, audio Ch-1/2 and time code can be inserted independently or in any combination.

PVM-14M2U/14M4U & 20M2U/20M4U

13-inch and 19-inch Production Monitors

Sony's best production monitors ever, the PVM-M Series provide stunning picture quality, ease of use and a range of optional functions. They are identical except that the "M4" models incorporate Sony's state-of-the-art **HR Trinitron** CRT display technology and have SMPTE C phosphours instead of P22.

- HR Trinitron CRT enables the PVM-14M4U and 20M4U to display an incredible 800 lines of horizontal resolution. The PVM-14M2U and 20M2U offer 600 lines of resolution. M4 models also use SMPTE C phosphours for the most critical evaluation of any color subject.
- Dark tint for a higher contrast ratio (black to white) and crisper, sharper looking edges.
- Each has two composite, S-Video and component input (R-Y/B-Y, analog RGB).For more accurate color reproduction, the component level can be adjusted according to the input system. Optional BKM-101C (video) and BKM-102 (audio) for SMPTE 259M serial digital input.
- Beam Current Feadback Circuit
- 4:3/16:9 switchable aspect ratio.
- True multi-system monitors they handle four color system signals: NTSC, NTSC 4.43, PAL, and SECAM.
- External sync input and outputcan be set so that it will automatically switch according to the input selected.
- Switchable color temp: 6500K (broadcast), 9300K (pleasing picture), User preset.(3200K to 10000K).
- Blue gun, underscan and H/V delay capability
- On-screen menus for monitor adjustment/operation.
- Parallel remote control and Tally via 20-pin connector.

PINNACLE SYSTEMS miroVIDEO DC-30 *PRO*

PCI Capture Card for Windows 95/NT

Pinnacle Systems' miroVIDEO DC30 Pro is the ideal solution for creating professional quality video productions. If you create corporate, commercial, wedding, event, multimedia or Internet videos, the high-powered software bundle and state-of-the-art hardware of the miroVIDEO DC30 Pro gives you unbeatable results. Includes Pinnacle Systems' powerful TitleDeko character generator plug-in for Adobe Premiere 5.1. Add creative, custom titles toyour video productions with Emmy Award-winning technology. Use the full version of Adobe Premier 5.1 to capture, edit and output professional quality productions for video, multimedia, and the web with . Also includes 300 unique Pixélan Software Video SpiceRack transitions and a high quality video and audio breakout box. The breakout box allows for convenient placement of connections on your desktop.

- 2.4:1 compression ratio for a better final video image quality. Compression ratios under 4:1 are considered to be "broadcast quality."
- Full NTSC, PAL, SECAM, for worldwide compatibility.
- Real-time video overlay on the computer monitor eliminates the need for an external video monitor.
- Professional breakout box brings your connections up front and easily accessible

Bundled Software:

- Full version of Adobe's Premiere 5.1 editing software gives you powerful editing tools to create professional productions
- Bring Hollywood-quality graphics to your video productions with TitleDeko. Easily add amazing titles to all of your video productions. Titles can fade up, scroll and even blend with pictures. Apply glows, neon and metallic looks, textures, shadows and shapes to your titles with any TrueType font.
- Pixelan Software's Spice Rack gives you over 300 transitions to choose from.
- Sonic Foundry's Acid Music software lets you create royalty-free music for your productions.
- MiroINSTANT Video saves time and disk space with accelerated, intelligent rendering. When rendering and playing your final production, miroINSTANT Video overcomes the 2GB AVI file size limitation, allowing you to quickly put more video directly onto tape – in one pass.

DC-30 *PRO*..799.00
NEW! DC-50...1649.00

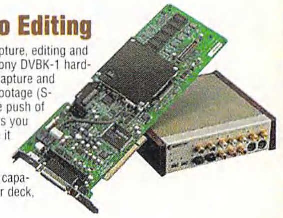
MiroVIDEO DC-30 *PRO* Turnkey System:

• 220-watt midtower case • Pentium 233 MHz MMX processor • PCI motherboard with 512K cache • ATI XPert-128 8MB PCI display card • 128MB of RAM • Quantum 3.2 GB IDE system drive • Seagate (Barracuda) 9GB SCSI-2 FAST/Ultra-wide hard drive • Initio 91004W Fast/Wide SCSI 2 controller • 3.5˝ floppy drive • Teac CD-532E 32X EIDE internal CD-ROM drive • Altec-Lansing ACS-43 2-piece speaker system • Focus 2001A keyboard • Microsoft MS mouse • Viewsonic GS771 17˝ 1280 X 1024 SVGA monitor • Windows 95 • MiroVIDEO DC-30 *PRO* video/audio capture card • Adobe Premiere 5.1 (full version) editing software, TitleDeko, Pixelan Software Spice Rack, Sonic Foundry Acid Music.......................................**$2495.00**

QUICK DIAL 731

canopus

DVRex-M1 DV Digital Video Editing



DVRex is a hardware and software bundle that offers a complete solution for the capture, editing and output of DV as well as analog video signals. Equipped with a software optimized Sony DVBK-1 hardware CODEC, a breakout box and Rex Edit software, the DVRex provides real-time capture and output of DV signals from your camera or VCR, allows seamless mixing of analog footage (S-Video or composite) with DV material, or can convert analog video into DV with the push of a button. DVRex also overcomes the 2GB limitation of the .AVI format. DVRex allows you tocapture up to 4GB (20 minutes of video) into one .AVI file and seamlessly capture it into multiple files

With the bundled Rex Edit software, capture and editing of native DV has never been so fast, easy and flexible!. Rex Edit features a timeline interface with real-time capabilities as well as effects and transitions. It also lets you control your DV camera or deck, batch capture video and audio, add new audio tracks and scrub in real-time.

Hardware Features:

- High quality, scalable video windows displays real-time, full-screen video during capture, editing and output.
- During analog capture and output, video characteristics like brightness, contrast, saturation etc. can be manually set.
- When incorporating effects, an optimized hardware DV codec cuts rendering time up to 25%.
- Unique DV breakout box can be used either externally or internal in a 5-1/4" drive bay. The box features composite and S-Video in/out, DV in/out and analog stereo in/out. With the optional M2 module it can also output component video signals and input/output digital audio signals (RCA and optical).

Rex Edit Software

Rex Edit 2.0 is an easy to use capture and editing program that features a timeline interface and drag-and-drop capabilities. You can add titles and transitions with ease and render them in seconds – much faster than video editing packages currently available.

In addition to these time saving features, Rex Edit requires no rendering. You can preview audio and video and output the final production in real-time directly from the timeline without rendering. Rex Edit also offers clip logging, batch capture, and deck control.

Assuring the best quality audio output, Rex Edit avoids re-mixing and re-sampling keeping the audio in its native DV form. To do this, Rex Edit incorporates enhanced audio processing capabilities through an audio compression management (ACM) driver which overcomes the need to convert DV audio formats. In addition, multi-channel audio mixing capabilities allow you to add additional audio tracks even though the .AVI file format doesn't support it.

w/Rex Edit Software..**$^{\$}1999^{00}$**
w/Rex Edit and Ulead Software.................................**$^{\$}2249^{00}$**

Rex*fx* Hardware-based 3D Effects Engine/Display Card f/DVRex-M1

A truly affordable 3D DVE solution, Rexfx is a hardware-based 3D effects engine and transition package that provides editors with a near-real-time alternative to more expensive real-time DVEs. Rexfx includes a sophisticated collection of 40 pre-set 3D effects, including mosaic, double doors, spinning cube and environment effects like haze and lighting.

- State-of-the-art hardware 3D engine and 16 MB of on-board memory provide near real-time rendering times.
- Video overlay in high-resolution (up to 1600 x 1200 at 32 bits per pixel).
- Though optimized for use with RexEdit, also offers significant gains in productivity when using Adobe Premiere 5.1 and Ulead MediaStudio Pro
- Really shines when rendering complex transitions and effects. While simple transitions and effects are rendered two to three times faster than with software-based effects programs, more complex transitions requiring advanced geometry calculations are rendered 20 times faster.

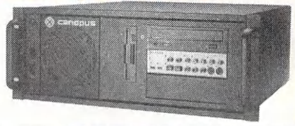
$^{\$}649^{00}$

Optional M2 DAT Pack Digital Audio I/O and YUV Output

The DAT Pack is for those who want a direct optical connection from the DVRex to DAT, mini disc players and high quality audio components. This solution provides a convenient way to keep audio in digital format throughout the editing process and offers copyright protection capabilities. The DAT Pack uses SPDIF input/output connectors and is easy to install. The DAT Pack also comes with the YUV video output option.

$^{\$}449^{00}$

RexRack Digital Video Editing Workstation



An affordable turnkey video editing workstation, RexRack is is a preconfigured system that just needs to be plugged-in and you're ready to start editing. With the RexRack you can edit your analog and/or DV productions with ease and speed. The RexRack is a P2-450 PC with 128MB of RAM, 8GB of boot drive, 16GB of high speed storage in a durable rack-mount chassis. It includes the DVRex-M1 capture card and Rexfx 16MB high performance AGP graphics card/effects accelerator, Rex Edit editing software, and the full version of BorisFX 3.5.

$^{\$}6995^{00}$ (Monitor Not Included)

TRUEVISION/*Avid*

TARGA 1000/MCXpress

Professional Video Production Workstation

Incorporating the award-winning TARGA 1000 video card and Avid MCXpress NT non-linear editing software, this fully-configured workstation meets the needs of production professionals, corporate communicators, educators and Internet authors.

TARGA 1000 Features:

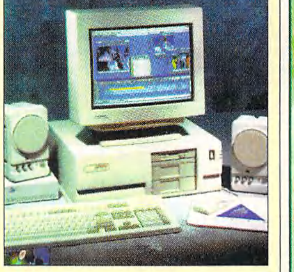
The TARGA 1000 delivers high processing speed for video and audio effects, titling and compositing. Capture, edit and playback full-motion, full-resolution 60 fields per second digital video with fully synchronized CD-quality audio.

- Compression can be adjusted on the fly to optimize for image quality and/or minimum storage space. Has composite and S-video inputs/outputs. Also available with component input/output (TARGA 1000 PRO).
- Genlock using separate sync input for working in professional video suites
- Audio is digitized at 44.1KHz or 48KHz sampling rates, for professional quality stereo sound. Delivers perfectly synchronized audio and video.

MCXpress Features:

The ideal tool for video and multimedia producers who require predictable project throughput and high-quality results when creating video and digital media for training, promotional/marketing material, local television and cable commercials, CD-ROM and Internet/intranet distribution. Based on Avid's industry-leading technology, it combines a robust editing functionality with a streamlined interface. Offers integration with third-party Windows applications, professional editing features, powerful media management, title tool and a plug-in effects architecture. It also features multiple output options including so you save time and money by reusing media assets across a range of video and multimedia projects.

TARGA 1000/MCXpress Turnkey Systems:



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VIDEONICS

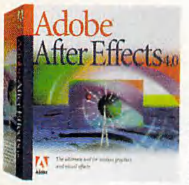
Effetto Pronto

Digital Video Effects and Compositing System for Macintosh

Effetto Pronto is a powerful combination of compositing and effects software, and a dedicated PCI hardware accelerator card. With a keyframe-based timeline compositing interface, Effetto Pronto blends all of the elements you want in your project.: video, graphics, 3D animation and anti-aliased text from the CG module. It even includes an audio track so you can animate to the beat of the music.

- Work with an unlimited number of tracks at any resolution
- Effetto is resolution independent so you can mix and match a variety of formats and seamlessly bring them all together
- Color correction, chroma and luma keying, 3D warps with perspective and 3D animatable lights.
- Advanced character generator offers unlimited text overlap, free-form text positioning, point and click typing, font and color palette thumbnails, drop shadows and glows and much more.
- Provides true 3D perspectives for your work. Any object can be rotated or warped on its X, Y, or Z axis, and can be positioned anywhere in 3D space.

Adobe



After Effects 4.0

The Most Powerful Tool for Compositing, 2D Animation and Special Effects

The industry-standard for professional motion graphics, After Effects is the most powerful tool available for producing high-end, unlimited composites, fluid animations, and sophisticated special effects. After Effects also generates the highest quality output at the desired resolution so it's the ideal design tool for film and video producers and editors, graphic designers, multimedia professionals and Web developers.

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ICE

Final Effects Complete

Final Effects Complete is a premium set of 60 motion graphics effects' plug-ins for Adobe After Effects which create professional special effects for film, video and other digital video production. Final Effects Complete offers the ability to generate rain, snow, fire, smoke, bubbles, liquid mercury distortions, explosions, 3D particles, liquid displacement and lighting effects, a multitude of stylistic transitions and other video effects.

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- Incredible one-of-a-kind stylistic effects. Burn your image away like melting film. Paint in brush strokes with a glue gun. Scatterize every pixel of an image. Create psychedelic flowing backgrounds and kaleidoscope patterns. Flip your image like a page turning in a book to reveal another image. Materialize an image into glass or a blobby substance over time.

Final Effects

- Dramatic or subtle lighting with spotlights, multi-colored light rays, light sweeps and light bursts. Time controls for echo and motion blurring effects.
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- Remove tell-tale wires from blue screens. Create alpha maps and sepia tones, composite between effect and source, and even rotate between color values **$799.95**

ARTEL Boris Effects 3.5

Artel
Boris EFFECTS
Television Quality 3D Effects

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- Blur and bevel filters.
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For PC (DEC Alpha) **1999.00**
For Macintosh **1899.00**
For SGI **2499.00**

INSPIRE 3D 3D Art & Animation Software (For Mac or PC)

Specifically designed to meet the demand of the graphics pro, Inspire 3D is a powerful program that lets you add a whole new dimension to your work by creating stunning print images, dynamic multimedia productions and slick web visuals that just aren't possible in 2D. With Inspire 3D, you can model, animate and render 3D elements in any style and complexity. By adding texture, motion, lighting effects and more, your print materials will almost pop off the page. Use the images you create as single frame print graphics or as lower resolution animation files for multimedia or the web or choose from a library of pre-created images. And use the photorealistic or stylized animation images you create for real-time graphics applications, including VRML 2.0, for all kinds of projects.

- Compatible with Photoshop, QuarkXPress, Illustrator, and more. Create simple or complex animations, transform Illustrator files into animated 3D graphics, create killer photorealistic 3D or cartoon-style images and use pre-created or custom modeling.
- Supports 16 image and seven 3D model formats output with resolutions up to 8,000 x 8,000.
- Expandable modeling capabilities and a ton of plug-ins for specialized functions. Spline-based modeling and MetaNURBs let you mold and manipulate objects in ways you never could before, then output them as hi-res images - fast. Use Inspire's library of designer images, create your own - or mix the two for interactive content, games, training materials and movies.
- Quickly and easily create brilliant single and composite images and animations to design exciting web sites.
- Uses LightWave 3D's formidable rendering engine to put true photorealistic capabilities right on your desktop. Gives your 3D images the edge you're looking for.
- Modeler lets you create any shape or form. Then reshape, subdivide, clone, modify, reposition and control any object in 24-bit color and view it in real-time.
- Build sophisticated, layered images for print or animation and combine 3D elements with 2D images or multimedia. You can also use photographs or video with 3D elements and apply front projection mapping to make the elements accurately cast shadows against the photo or video image.
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Inspire 3D for Windows **385.00**
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Powerful Production tool for Animation, Paint and Video Layering

Aura is a one-of-a kind palette of paint tools, compositing, cel animation, special effects, video elements, 2D animation and character generation, Aura blends key features of all of these tools into one superb system. So you can take any digital image… no matter what the source… and add motion, color, 2Dand 3D elements, effects and titles. Throw in rotoscoping, video painting and layering and you can add color and depth to any production. Aura also works seamlessly with LightWave to give you a complete production environment.

Animation, Video and Layering:

- Time-line based animation and video element assembly
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EQUIPMENT LEASING AVAILABLE

Circle # 213

Continued from page 45

invisible, we need a body again. Reload the "FurGuy.lwo" object, and parent "FurGuy-Roots.lwo" to it. Now we're ready to color the new fur we created.

24. Since this is another fur surface, it should be textured the same way we did the original fur, complete with transparency and bumps. Simply copying the settings used for the first object will do fine; but there's no reason to keep all the settings identical, though they should be relatively similar. The change that should be most obvious is color. For starters, try making the roots a very light tan (200, 170, 140) and the fur a very dark brown (80, 60, 40) color. Figure 13 shows a close-up of this color scheme, revealing the subtle shading it creates. Experiment with different color combinations to get a feel for how this works.

Unlike the object morphing, morph amounts outside the normal 0-100% range have no effect on Surface Morphing. The source surface will always be visible at 0% and below, and the target surface will be visible from 100% and higher. Between 0 and 100% is where the two surfaces will be blended. This works well without setup of starting with a negative morph amount. With a 50% Blur Length, only the last half of the morph will be rendered. The morph from -100% to 0 will have already occurred in the space before the current frame, so what we're left with is the remaining morph from 0 to 95%. This happens to be the portion of the morph that contains the actual surface morph. What we end up with is the entire surface morph being recorded in the frame, while only the last half of the actual geometry morph is rendered. Using a negative initial morph value not only makes controlling the thickness of the fur easier, but it also allows us to use the full surface morphing range.

The length of the fur may also be controlled for details such as faces, eyebrows, beards, etc. by adjusting the fur object in Modeler. By manually dragging points on the fur object, you can not only control the length of the fur in areas (keeping it short around the face and hands), but also control the direction it seems to grow in. By selecting the top of our critter's head and then rotating it back slightly, we can give him a combed look. By pulling points down on his arms, the fur will look longer below them and look a little more flattened on the tops, as though gravity was pulling it down.

Even creative placement of bones can achieve similar results. A thin bone placed down the back with Limited Range can be used to pull out a ridge of fur. Bones may also vibrate as well, to further control fur direction. Multiple fur objects built for specific areas (a beard for example) may also be used to further dress the character up.

Now that we know how to 'flur' a character like this, how do we make him move? Since the fur object is a separate object, the bones of a parent object can't affect it. Luckily, we have that [Clone Object] button. While setting up a scene with a character you plan to flur, just set the scene up normally, adding all the necessary bones. When the motions are to your liking, simply clone the character. This will create an exact duplicate, including all the motions and envelopes of the first. All you need to do then is use the [Replace Object] option to replace this duplicate with the fur object, and then set up the morph envelope as we have here.

This technique is fairly simple and quick to set up and quite versatile as well. There are many more possibilities than I can cover here. Adding translucency to the fur, through the use of such plug-ins as Gaffer, Lampy, Lumetools, etc., can really enhance the back-lighting effect along the edges, and the various Fresnel shaders can add a lot of impact as well. Again, the best advice I can give anyone is to just play around and don't be afraid to try out ideas. Above all, have fun. NT

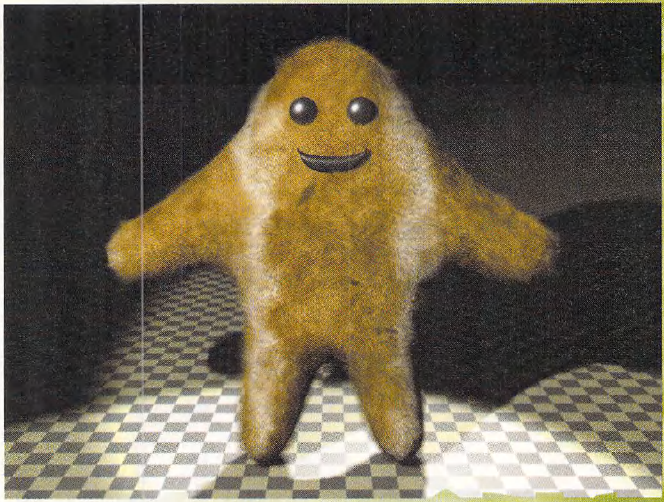

Figure 11. The same fur again, this time with the added displacement map.

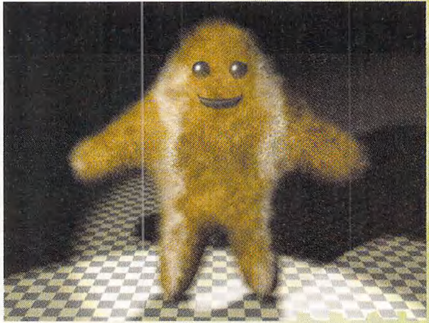

Figure 12. By using a negative percentage for the initial morph amount, we can create longer fur.

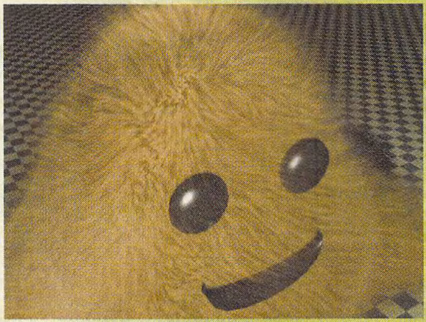

Figure 13. A close-up of the fur, using a surface morph to create light roots and dark tips.

Dave Jerrard is the lead tutorial writer for NewTekniques Magazine, and is one of the authors of LightWave 3D Applied. You can email him at djerrard@execulink.com

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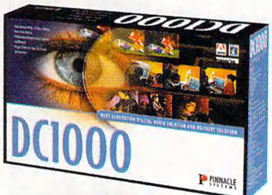

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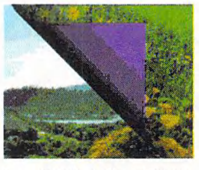

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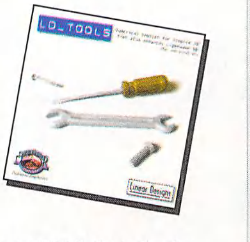

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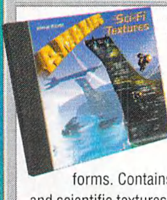

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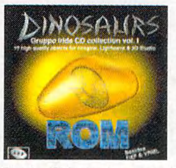

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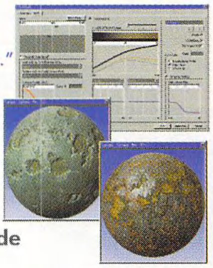

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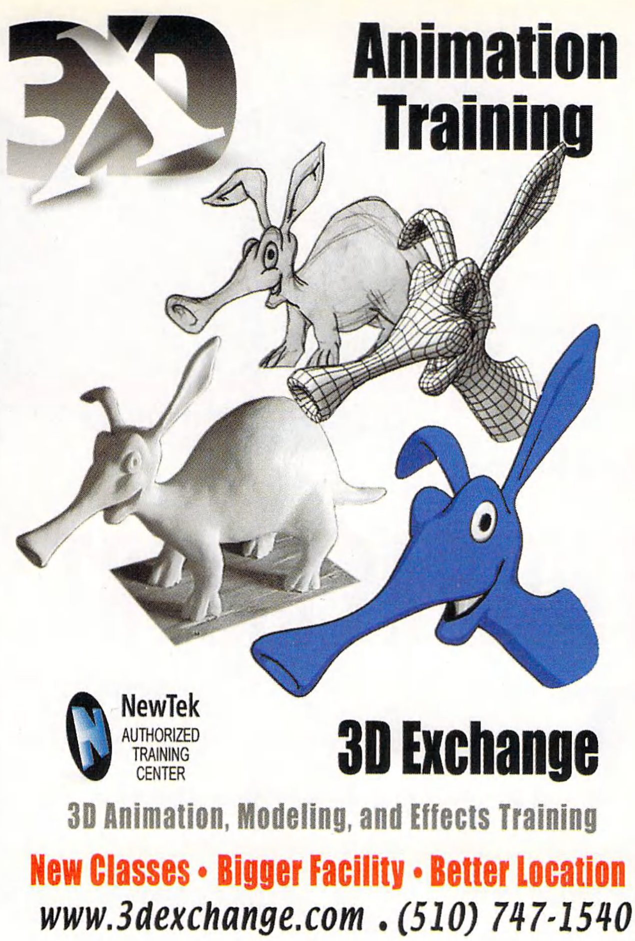
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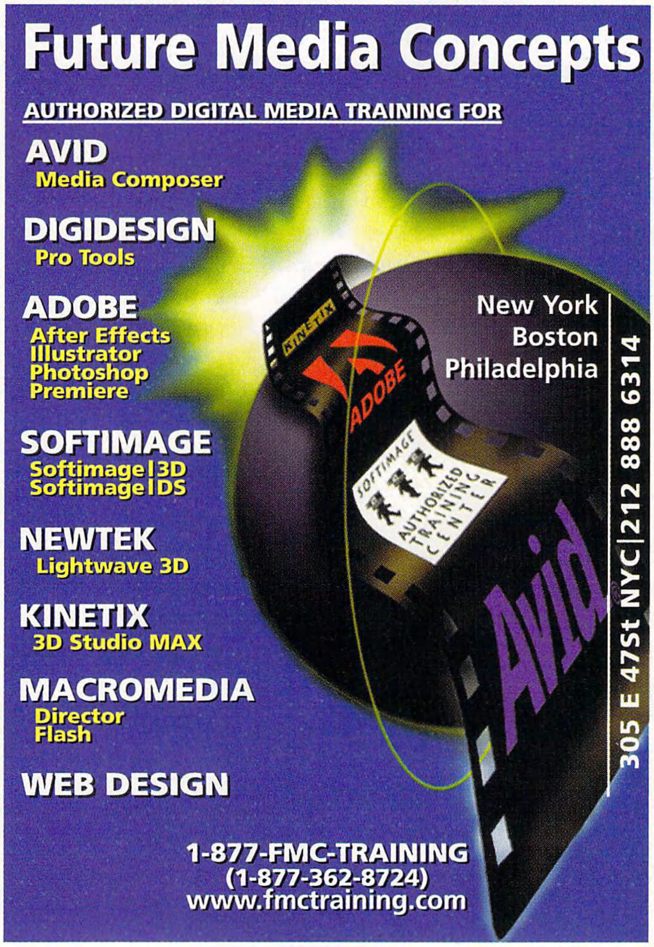
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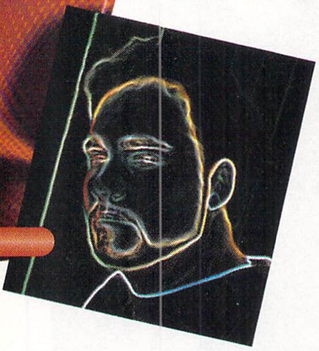

Paul: TWICE AS BRIGHT

BY MOJO

There we were, sitting inside his Accura NSX. It was late, and we were in a hurry to be someplace; but Paul still took the time to get out of the car and put a new CD in the changer. "You've got to hear this," he said.

Still parked in the driveway of his home, Paul skipped ahead and went right to the track titled "Carbon Freeze". We both sat there absolutely transfixed, soaking up every note as if it were drops of honey.

The time was 1993, and the CD was the newly remastered soundtrack to *The Empire Strikes Back*, containing music never before released.

We were both ecstatic.

If you think we were overreacting, you have to understand: at the time, this was one of the Holy Grails of soundtrack music. To actually be listening to a piece of music that we had been dying to get our hands on for years, was quite an emotional moment - and to be experiencing it with one of the few people who actually understood and shared that passion, made it all the more meaningful.

It was a short, seemingly trivial instance in which two nerds bonded, but it is perhaps my strongest memory of Paul Montgomery. Since I learned of his death one week ago, I have been trying to figure out why.

As I relayed the sad news at work, I was very surprised by the number of people at Foundation Imaging who hadn't heard of him. It was a concept hard to grasp, since so many of the people working at the company (including myself) might not be there if it weren't for Paul Montgomery. After all, it was he who suggested that Ron Thornton hire a certain starry-eyed young lad in Tech Support to help out on the *Babylon 5* pilot.

Paul founded the First Amiga Users Group (FAUG), and began working at NewTek solely because of his enthusiasm for DigiView. He saw great potential in Tim Jenison and this little computer video company, and wanted to be a part of something he knew would be special.

During the years that followed, Paul's unique vision and savvy marketing skills helped transform Tim's ideas and inventions into an empire. Paul was behind many of NewTek's clever advertising strategies, including the wildly successful "Revolution" videotape campaign, which brought the Video Toaster into the worldwide spotlight.

In addition, it was Paul who recognized the potential of LightWave and lobbied to have it included as part of the Toaster. His foresight brought 3D tools to an audience that might not have been exposed to them otherwise, and helped initiate the modern bond between CGI and broadcast television - not to mention his role in insuring that LightWave be used as a visual effects tool for *Babylon 5*, paving NewTek's way into Hollywood.

Although he would eventually leave NewTek and form a new company, Play Inc., his efforts have helped open the door of opportunity for many NewTekniques readers. He deserves to be remembered by everyone.

But to many, Paul will be remembered as much more than a marketing genius, or computer visionary - he will be remembered as a good friend. He touched the lives of the people he worked with in a way few could. To his credit, he rarely ever seemed like a boss - more like a smart, fun guy who made you want to do a good job.

Paul had a knack for bringing out the best in people. He would always encourage creativity, and reward good work with things like trips to Amsterdam or all-expense-paid weddings. Inevitably, he helped many people realize their own potential, and brought an enthusiasm and passion to the workplace that made you forget it was work!

For those who shared interests and ideals with him, however, he was far more than a mentor. He was a close friend you could always turn to. No matter what the circumstances, Paul had a way of making you feel safe and secure and that any problem could be solved.

Despite his stature, however, no matter how much you looked up to him, Paul was still just one of the guys. Maybe that's why listening to "Carbon Freeze" in the car with him, was such a special moment. Despite all that separated us professionally, we were still just two *Star Wars* fans having fun geeking out together.

At 39, Paul's death seems grossly unfair. My heart goes out to his wife and everyone at Play who must feel very, very robbed.

I don't know if it was meant to be pointing to some kind of universal constant, but there's a line in *Blade Runner* (one of Paul's favorite films), that manages to bring me at least a little solace in this tragedy. As Roy Batty, the pinnacle of Replicant technology, nears an early demise, he asks his creator why he cannot have a longer life; he is told, "The candle that burns twice as bright, burns half as long and you, Roy, have burned so very brightly."

So very brightly indeed, Paul. So very bright.

Mojo is a senior supervising animator at Foundation Imaging.

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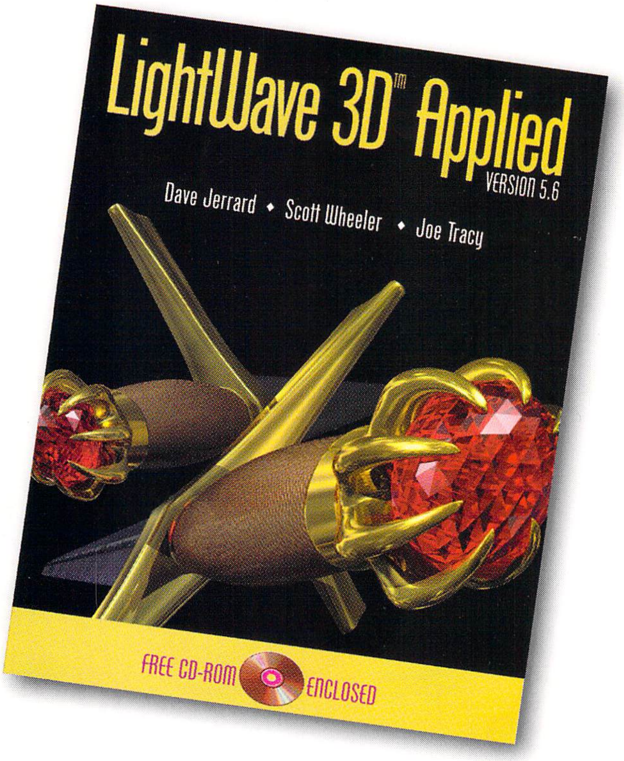

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